

# **External evaluation of mobile phone technology based nutrition and agriculture advisory services in Africa and South Asia**

## **Mobile phones, nutrition and agriculture in Tanzania: Business Modelling Baseline Report**

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5 July – final version approved by DFID

## Acknowledgements

The authors would like to thank all the stakeholders interviewed who agreed to take part in this research. We are particularly grateful to the mHealth Tanzania PPP team and TFNC staff in Tanzania for their cooperation, to the GSMA for their ongoing cooperation, and to DFID and OPM for their continued support. We thank all the stakeholders that we interviewed (often several times) for their time and patience. Finally, we would like to acknowledge all internal and external reviewers of draft reports.

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This material has been funded by UK Aid from the UK government; however, the views expressed do not necessarily reflect the UK government's official policies.

This project is being led by the Institute of Development Studies (IDS) together with GAMOS and the International Food Policy Research Institute (IFPRI) as part of the e-Pact consortium led by Oxford Policy Management (OPM) co-managed with Itad. The IDS project manager is Jessica Gordon [j.gordon@ids.ac.uk]. The report authors are Simon Batchelor, Nigel Scott & Jenny Sharp (Gamos). For further information please contact j.gordon@ids.ac.uk

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## Executive summary

This is the phase 1 report for the business modelling analysis of the Healthy Pregnancy Healthy Baby text messaging service, Tanzania (also more widely known as Wazazi Nipendeni), a Value Added Service (VAS) supported by the GSM Association (GSMA) as a part of the mNutrition programme. It presents a baseline description of the service and an analysis of the business models based on data available at the beginning of the mNutrition evaluation. mNutrition is a global initiative supported by DFID, organised by GSMA, and implemented mainly by in-country mobile network operators (MNOs) to use mobile technology to improve the health and nutritional status of children and adults in low-income countries around the world. This report forms part of the evaluation of mobile based services, which draws on a number of methods and interlinked components to gather evidence about the impact of the intervention in Tanzania supported by the mNutrition programme.

This report presents baseline data to inform further analysis to address the following research questions in the Terms of Reference (see Annex A), which state: “How commercially viable are the different business models being employed at country level?” and “What lessons can be learned about best practices in the design and implementation of mobile phone based nutrition services to ensure (a) behaviour change and (b) continued private sector engagement in different countries?”

The report is one of four baseline deliverables for the “External evaluation of mobile phone technology based nutrition and agriculture advisory services in Africa and South Asia”. The scope of the evaluation is therefore the mobile based service as deployed under the mNutrition programme, rather than the incremental impact of support provided through the mNutrition programme. This report should be read in conjunction with the baseline Cost-Effectiveness Report (Batchelor, Sharp & Scott 2017). The deliverables Quantitative Baseline Report (Gilligan et al., 2017) and Qualitative Baseline Report (Barnett et al., 2017) give insights into the consumer environment that the service is targeted at.

Given the complexity of the partnerships involved in the mNutrition projects, Osterwalder and Pigneur’s (2010) inductive approach to business model generation is being used as a framework for the research. The aim of this baseline report is, therefore, to provide a detailed description of each of the building blocks of the business model canvas as at the beginning of the independent study. It also provides a review of operating experience since the beginning of the mNutrition project that may provide context for changes that have already taken place in the product design.

**Figure 1 Building blocks in the canvas (derived from Osterwalder and Pigneur (2010))**

*Authors own*

After setting the scene with some contextual and historical insights, the report outlines the vision for the addition of nutritional messaging to the Wazazi Nipendeni service. Wazazi Nipendeni has been providing text based health messages since 2012 to mothers during pregnancy and up to 16 weeks post-partum. The addition of nutritional messages adds value to the service, and potentially extends the period of engagement with a mother up until the child's fifth birthday.

The vision of GSMA for the health component of mNutrition was to create an aggregated bundle of health-related services, including a nutrition component, that could be accessed by subscribers to any MNO. In Wazazi Nipendeni, they found a group that fulfilled a majority of their aspirations. This group already had a service working with the four major MNOs, and had in place the institutional framework to expand their operations to include nutritional messaging. The group also had deep connections into the government and as such looked as though it could be a service that would fulfil the GSMA vision, i.e. on a trajectory to be embedded in the national health service. Features of the original clearing house concept for the mNutrition partnerships that are absent from the Wazazi Nipendeni partnership include a mechanism for generating revenue directly from the service, and the engagement of a private sector organisation, over and above the support provided to the programme by the MNOs. GSMA have been concerned about the implications of this for the longer term commercial sustainability of the product, and have taken steps to stimulate new thinking among key stakeholders. A further consequence of abandoning the clearing house concept was that additional support was required to assist with the localisation of content.

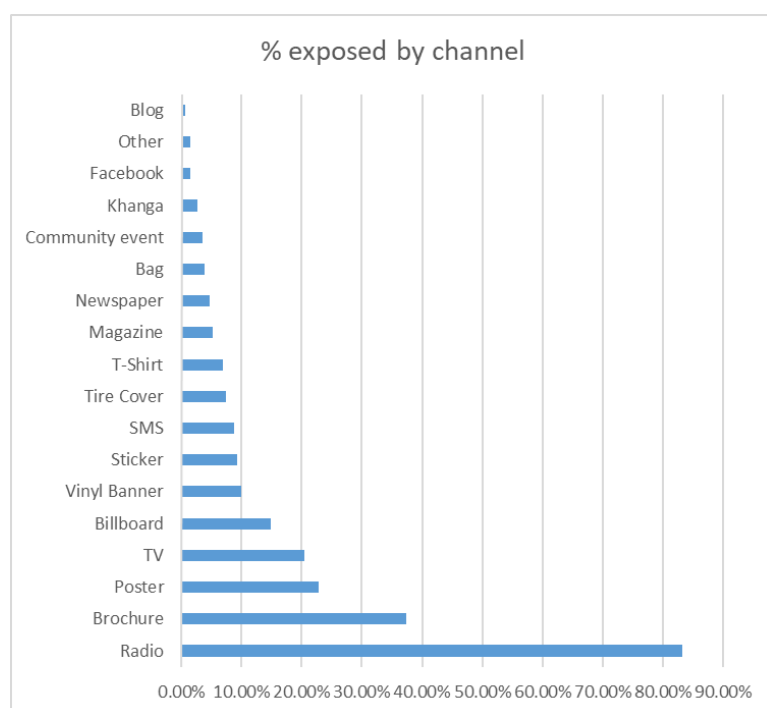
The report then examines each building block on the canvas in Figure 1, in as much detail as was available at the end of March 2017. On this basis, it is proposed that the business model can be regarded as a multi-sided platform business model, which are commonly associated with information technology businesses. It provides a means of making a product free to one group of customers, while another group pays. Wazazi Nipendeni brings together two groups, providing a link between funders, who pay for the service, and users who receive the service for free. Funders with a health mandate benefit from improved health outcomes achieved by users. Field level partners cannot really be considered a third side to the platform because they already have their own link to users through their field presence. The relationship with Wazazi Nipendeni can be considered as a simple business to business transactional arrangement as described – Wazazi

Nipendeni provides a valuable service, and partners drive users to the system. The business model will continue to evolve and there are considerable changes underway at the time of writing this report – therefore the official end of baseline data collection was considered a reasonable point at which to document findings. Key points from each of the building blocks of the canvas are as follows:

- Customer segments (page 24) – The baseline for the qualitative component of the evaluation suggests that among young, married women, who are the primary Customer Segment, it tends to be husbands who control their access to phones, either through consent to ownership, by buying a handset / SIM for their wives, or by sharing their own phones with their wives. Husbands are, therefore, a key Customer Segment, and indeed are accommodated in the Wazazi Nipendeni service as Supporters of pregnant women. The frog User Experience surveys suggested that *“Men are more than supporters, they are a key for behavioural change.”* (Frog, 2016).
- Value proposition (page 28) – The Wazazi Nipendeni multimedia campaign directs women to health services, and to the text messaging service. The aim is to encourage women to avail themselves of health services targeted at improved neonatal health outcomes. Subscribers to the text messaging service receive an average of 3-4 messages a week across several safe motherhood topic areas. The text messages reiterate the messages of the campaign. Building on these messages (some of which were nutritional in orientation), the mNutrition programme’s content processes created 62 factsheets, 990 SMS and 312 voice transcripts (Blomberg 2016). Once added to the Wazazi Nipendeni database, a total of 156 nutrition messages made up about 70% of all messages on the system. Early indications are that nutrition information is not regarded by users as particularly relevant. Message localisation was hampered by the change in concept from a clearing house approach, which resulted in something of a disconnect between content development and delivery. The Tanzania Food and Nutrition Centre (TFNC), a Government body, took an active role in signing off the localisation of these messages, and this process went particularly smoothly (compared to some other countries). The Wazazi Nipendeni text messaging service does not work in isolation, relying on the reinforcing of health messages delivered through multiple channels.

Channels (page 37) – As a multi-media campaign, women were targeted through a comprehensive range of channels (see Figure 2). While some may argue that SMS excludes the illiterate, the qualitative survey found that other family members can read the message for the person, and that text messages are preferred over audio because they can be read repeatedly, they can be shared with friends and colleagues at any time, and audio messages may be heard incorrectly.

**Figure 2 Women's exposure to campaign materials derived from data from Johns Hopkins Center for Communication Programs (CCP) <sup>1</sup>**



*Authors own*

- Customer relationships (page 41) – The aims of the Customer Relationship that Wazazi Nipendeni creates with users can be considered to be threefold. Acquisition – getting people to register for the service. Retention – from the MNO's point of view, the service offers a mechanism for increasing customer loyalty over the period of relevance of the content. Compliance – from a health outcomes point of view, the service will achieve greatest impact if it can successfully persuade people to constructively change their behaviours. Wazazi Nipendeni has a strong brand, which is quite distinct from the MNOs that support the service, and it is asserted that users view it a Ministry service. However, given that most of the funding for the mHealth Tanzania PPP comes from CDC, it can be argued that the most important relationship is that with CDC.
- Revenue Streams (page 44) – Wazazi Nipendeni is free of charge to users, so there is no direct revenue stream. It was originally envisaged that information would be made available using a freemium model, in which basic services would be offered for free, but costs of the nutrition content delivery would be covered by charges made for advanced features. However, late in 2016 the mHealth Tanzania PPP and the TFNC held intense negotiations over whether or not Wazazi Nipendeni would be permitted to charge for these information services. In the end, the government insisted that health information should be made available to citizens free of charge. This view had to be respected, given the role of TFNC as a core partner, the fact that the Ministry of Health owns the new platform on which Wazazi Nipendeni is hosted, and the regulatory role of the Ministry of Health in approving mHealth services. The result is that the service is vulnerable to any withdrawal of funding from CDC, and to a termination of the zero rating of text messages by the MNOs. GSMA are working to mitigate this.
- Indirect benefits (page 46) – Even though the mHealth Tanzania PPP deals mostly with CSR departments within MNOs (but also marketing), its commercial value is becoming recognised in that it increases ARPU and reduces churn. Over and above the effect that VAS have on loyalty, some of the messages distributed encourage women to communicate with their friends and family, for example, all of which encourages them to make more calls. The original Wazazi

<sup>1</sup> [http://www.thehealthcompass.org/sbcc-spotlights/Wazazi Nipendeni-nipendeni-love-me-parents](http://www.thehealthcompass.org/sbcc-spotlights/Wazazi-Nipendeni-nipendeni-love-me-parents)

Nipendeni content offered the potential of holding customers on the network for up to 12 months (8 months of pregnancy and 4 months post-partum), but incorporating nutrition content covering children up to the age of 5 years now potentially extends the period of relevance to over 5 years. The GSMA are currently looking into indirect benefits, and the Business Intelligence Unit are negotiating with MNOs to gain access to the kind of data needed to conduct this analysis.

- Key resources (page 49) – The text messaging service originally ran on a platform developed by Text to Change Mobile (TTCM) in partnership with the Praekelt foundation. The ‘Vusion’ platform was designed to deliver high volumes of messages at scale through direct connections to MNO SMS gateways. Wazazi Nipendeni has since migrated to a new platform, created for the Ministry of Health by a local software developer (Rasello). The service was migrated to the new platform in October 2016, and benefits from improved reliability as well as monitoring and reporting facilities. It is worth reiterating that the text messaging service is not intended to operate in isolation, rather it is expected to serve as part of multi-media campaigns, so these campaign based interventions are a key resource required in order to deliver the full potential of the Value Proposition.
- Key Activities (page 51) – Successful networking probably depends mostly on having good contacts, which both TFNC and the mHealth Tanzania PPP clearly do. It also depends on the degree of influence that partners have, and this appears to be a particular strength of the TFNC, as they are well integrated into national nutrition strategies.
- Key Partnerships (page 53) – The complex set of partnerships brokered by the mHealth Tanzania PPP and TFNC is a defining feature of the Wazazi Nipendeni service. Organisations that have contributed to the development of the Wazazi Nipendeni text messaging service (prior to the mNutrition project) are illustrated in the report. This is a large section of the report, and the partners are considerable.
- Cost structure (page 60) – Due to the complexity of the Wazazi Nipendeni partnerships, the additional nature of the nutritional component building on what has gone before, and the lack of a single budget for the intervention, it has been difficult to draw out the relevant costs. Nevertheless, a cost structure has been proposed on the basis of limited data plus estimates.
- Investment (page 63) – Although a large number of organisations have invested in Wazazi Nipendeni and the text messaging service over the years, they have done so on a grant or expenditure basis, i.e. there is no expectation of receiving any financial return on this investment. From a financial perspective, these can be considered as sunk costs. Most of the funding sunk into development of Wazazi Nipendeni has come from donors.

The report considers some alternative approaches in Tanzania and, while Wazazi Nipendeni is the only behaviour change communication project to have reached scale, the MNOs have launched some interesting mHealth projects.

The report ends with an assessment of each of the building blocks described using a range of criteria (scored using a Likert scale from -5 = very poor to +5 = very good); these scores are referred to throughout the report as key points are made. This analysis shows a fairly mixed picture of strengths and weakness throughout the business model, but in terms of trends, it highlights the value of the partnership and the way that works. The partnership model results in a mixture of positive and negative scores for the cost / revenue assessment. This is because on the one hand funding from a small number of funders (direct and in-kind) through fixed term (five year) agreements is guaranteed and secure, but on the other hand there is a good deal of uncertainty as to what may happen when these agreements expire. The development of the new Ministry of Health platform has opened up a new world of opportunities for the mHealth Tanzania PPP, such as generating revenue from hosting services to be run by third parties, and developing synergistic



partnerships with other mHealth initiatives and services that can benefit from integrating the Wazazi Nipendeni service into their own programmes.

Although it is not possible to draw any firm conclusions from a baseline report, the analysis has highlighted some interesting findings, which can be summarised in terms of the following narrative:

- The current business model is a multi-sided platform model, which provides a means of making the service free to users, while donors, government, and MNOs pay for the service. Health and nutrition services tend to deliver benefits not only to the individual user, but also at a wider, societal level. This is of particular value to third parties such as governments and MNOs (as better health means higher disposable income).
- Indeed, the level of commitment of government partners has been a key feature of the mHealth Tanzania PPP, especially those linked into national nutrition strategies. They have been instrumental in the content localisation process, they have secured the new platform, and have contributed financially. This reflects how well the Wazazi Nipendeni service fits with a number of government commitments such as the CARMMA, the Maputo Plan of action, Scaling up Nutrition (SUN), and the Open Government Partnership.
- MNOs have clearly recognised the value of the service, and are covering the largest single operating cost item by zero-rating SMS messages. However, there is a tension between getting multiple MNOs to participate in a service, and getting them to extract maximum value from their investment. Four MNOs participate in the Wazazi Nipendeni service through their CSR activities, but once they see that a VAS yields quantifiable financial benefits, they may come to regard it as a commercial venture, in which case it is likely they will demand exclusivity, which then reduces the potential reach of any service.
- Alternative revenue streams are elusive at present, primarily as it is not possible to charge users directly. There seems to be something of a mismatch between mHealth services and commercial viability, mainly due to the fact that government health policies (at least in African countries) tend to promote free access to health services, which is deemed to include mHealth services. However, the private sector already plays an important role in health service provision, and the current health sector policy calls for innovative public private partnerships in health care financing, so the Ministry's position may yet shift.
- It is not clear that users would pay for a nutrition based service. Early evidence suggests that nutrition is not regarded by potential users as a priority, and people have little appetite for nutrition information. It is a low priority for primary health care services, and community workers do not have a detailed understanding.
- The business model remains highly dependent on donor funding through CDC, the presence of operational partners with a neonatal health mandate and, increasingly, a nutrition mandate, and on MNOs continuing to zero rate SMS messages. Increasing interest in nutrition would suggest that donor funding is indeed likely to be forthcoming, and a stream of organisations setting up interventions in the country that wish to incorporate mobile services into their offerings is likely to materialise, but MNO CSR priorities can change rapidly with a change in leadership.
- The mHealth Tanzania PPP are well aware of these vulnerabilities in the business model. They are currently exploring options for increasing revenue from various partners including the government, and field partners (NGOs). The new platform appears to offer several opportunities. Firstly, they can offer to host services run by third parties, which presents opportunities for generating revenue. Secondly, attracting other services to the platform provides opportunities for establishing synergistic links to the Wazazi Nipendeni service. It also has wider implications by lowering barriers to deploying further mHealth apps in Tanzania.



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## List of abbreviations

AIDS	Acquired Immune Deficiency Syndrome
AKHST- JHI	Aga Khan Health Services Tanzania - Joining Hands Initiative
ANC	Antenatal Care
ARPU	Average Revenue Per User
BMJ	British Medical Journal
CABI	Centre for Agriculture and Biosciences International
CARMMA	Campaign on Accelerated Reduction of Maternal Mortality in Africa
CCBRT	Comprehensive Community Based Rehabilitation in Tanzania
CDC	US Center for Disease Control and Prevention
CHW	Community Health Worker
COSTECH	Commission for Science and Technology (Tanzania)
COUNSENUTH	Centre for Counselling Nutrition and Health Care
CSR	Corporate Social Responsibility
DFID	Department for International Development
DHS	Demographic Health Survey
E1M	Everyone Mobile
EGPAF	Elizabeth Glaser Pediatric AIDS Foundation
FHI 360	Family Health International 360
FMCG	Fast Moving Consumer Goods
GAIN	Global Alliance for Improved Nutrition
GCP	Global Content Partnership
GSMA	GSM Association
HIV	Human Immunodeficiency Virus
HNI	Human Network International
HPES	Health Promotion and Education Section (Tanzania)
HPHB	Healthy Pregnancy Healthy Baby
ICPD	International Conference on Population and Development
IDS	Institute of Development Studies
IFPRI	International Food Policy Research Institute
ILRI	International Livestock Research Institute
IVR	Interactive Voice Response
IYCF	Infant and Young Child Feeding
JHCCP	Johns Hopkins Center for Communication Programs
Jhpiego	Johns Hopkins Program for International Education in Gynecology and Obstetrics
LCP	Local Content Partners
M4RH	Mobile for Reproductive Health
MAMA	Mobile Alliance for Maternal Action
MDG	Millennium Development Goals
MNO	Mobile Network Operator
MoHSW	Ministry of Health and Social Welfare (Tanzania)
NACP	National AIDS Control Programme
NBS	National Bureau of Statistics
NGO	Non- Governmental Organisation
NMCP	National Malaria Control Programme
O&P	Osterwalder and Pigneur (Business Model)
OBD	Outbound Dialling
OCGS	Office of Chief Government Statistician
OECD	Organisation for Economic Co-operation and Development
OPM	Oxford Policy Management
PEPFAR	President's Emergency Plan for AIDS Relief
PMI	President's Malaria Initiative
PMTCT	Prevention of Mother to Child Transmission

PPP	Tanzania mHealth Public Private Partnership
QA	Quality Assurance
QC	Quality Control
RCHS	Reproductive and Child Health Section
SBCC TWG	Social and Behaviour Change Communication Technical Working Group
SIM	Subscriber Identity Module
SMS	Short Messaging Service
SP	Sulfadoxine-pyrimethamine (malaria treatment)
TTC	Text to Change
TTCM	Text to Change Mobile
TACAIDS	Tanzania Commission for AIDS
TB	Tuberculosis
TCCP	Tanzania Capacity and Communication Project
TDHS-MIS	Tanzania Demographic and Health Survey and Malaria Indicator Survey
TFNC	Tanzania Food and Nutrition Centre
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
UX	User Experience
VAS	Value Added Services
VFM	Value for Money
VP	Value Proposition
WEI	World Education International
WHO	World Health Organisation
WN	Wazazi Nipendeni

# 1 Introduction

A mounting body of evidence links early childhood undernutrition to increased morbidity and mortality (Pelletier et al., 1995) as well as to poor adult outcomes including shorter stature, decreased educational attainment, reduced economic productivity (Alderman, 2006; Victoria et al., 2010; Hoddinott et al., 2013), and increased incidence of non-communicable disease (Barker et al., 1989; Gluckman and Hanson, 2004). Despite the potentially serious consequences, early childhood malnutrition remains common around the world: as of 2011, 165 million children under the age of five were stunted and 52 million children under the age of five were wasted (Black et al., 2013).

Though the causes are inarguably complex, poor maternal nutrition during pregnancy (Black et al., 2013; Christian et al., 2013) and inadequate Infant and Young Child Feeding (IYCF) practices (Bhutta et al., 2013) are thought to be two of the principal drivers of early childhood undernutrition. Improving these behaviours therefore seems likely to generate important returns for both childhood nutrition and adult well-being.

With the rapid increase in access to and ownership of mobile phones across sub-Saharan Africa and the broader developing world (Pew Research Center, 2015), Information Communication Technology (ICT) interventions using mobile phones are increasingly seen as a feasible way to disperse information to individuals and households. Largely, though not exclusively, these campaigns have focused on improving farmers' information for agriculture through the provision of crop and input prices, weather information, and agricultural extension services (Svensson and Yanagizawa, 2009; Fafchamps and Minten, 2012; Hildebrant et al., 2015; Courtois and Subervie, 2015; Aker et al., 2016; Cole and Fernando, 2016).

Though less common, ICTs and specifically SMS-based information interventions have also been used to provide health-related information (Labrique et al., 2013). Typically, these interventions target improved patient drug adherence (Nglazi et al., 2013) or behaviour change related to sexual and reproductive health (Rokicki et al., 2017). Few SMS-based message campaigns have targeted nutrition-related behaviour change. Jiang et al., (2013) and Flax et al., (2014) test whether two such interventions influence IYCF practices in Nigeria and China, respectively. To date, the existing research on ICTs for nutrition and health finds mixed results on their effectiveness and the nutrition-focused ICTs have not been designed to test for impacts on child nutrition outcomes.

mNutrition, a global initiative supported by DFID, organised by GSMA, and implemented by in-country service management organisations in cooperation with mobile network operators (MNOs), explores the potential to use mobile technology to change attitudes, knowledge, behaviours, and practices for improved nutritional status. In Tanzania, the programme focuses on the provision of nutrition and health information and services to vulnerable pregnant women and caregivers of children under the age of five on their mobile phones with the goal of improving nutrition outcomes and behaviours for mothers and young children.

## 1.1 Objectives

The mNutrition evaluation is intended to understand and measure the impact, cost-effectiveness and commercial viability of the mNutrition product using a mixed methods evaluation design. The evaluation includes a quantitative component, a qualitative component and a business model analysis. The evaluations are being conducted by a consortium of researchers from Gamos, the Institute of Development Studies (IDS) and the International Food Policy Research Institute



(IFPRI). The team draws on a number of methods and interlinked work streams to gather evidence about the impact of the mNutrition intervention in Tanzania.

- A **quantitative impact evaluation**, employing a randomised control trial (RCT) to determine the causal effect of the programme. This component will conduct large-scale, statistically representative household surveys at the start of the programme implementation and 2 years later.
- A **qualitative impact evaluation**, which consists of three qualitative data collection rounds (i.e. an initial qualitative exploratory baseline, in-depth case studies at midline, and rapid explanatory qualitative work after the quantitative endline survey data collection) and aims to provide understanding of the context, underlying mechanisms of change and the implementation process of mNutrition.
- A **business model and cost-effectiveness evaluation** employing stakeholder interviews, commercial and end user data, document analysis, and evidence from the quantitative and qualitative evaluation data to generate a business model framework and estimate the wider imputed benefits from the value added service for the range of stakeholders involved.

The business model and cost-effectiveness component of the evaluation is designed to contribute evidence to help answer the first of the broad research questions specified in the Terms of Reference (Terms of Reference, Annex A), and the last two:

1. What are the impacts and cost-effectiveness of mobile phone based nutrition services on nutrition, health and livelihood outcomes, especially among women, children and the extreme poor?
5. How commercially viable are the different business models being employed at country level?
6. What lessons can be learned about best practices in the design and implementation of mobile phone based nutrition services to ensure (a) behaviour change and (b) continued private sector engagement in different countries?

The mNutrition intervention is being externally evaluated in two countries. In Tanzania, where the research consortium is evaluating mNutrition within a broader mHealth programme, the intervention aims to promote behaviour change around maternal and early childhood health and nutrition. The target group is therefore comprised of pregnant women and caregivers of children under the age of five years who reside in rural areas of the study region (Iringa). In Ghana, the intervention is implemented via an mAgriculture programme. The Terms of Reference refer to the impacts and effectiveness of mobile phone based services, so the scope of the evaluation is the mobile based service as deployed under the mNutrition programme, rather than the incremental impact of support provided through the mNutrition programme.

The intended audience for the business modelling baseline report is DFID, along with other organisations involved in mNutrition and mHealth programmes globally (including local MNOs and NGOs implementing mNutrition services), national governments—in particular, the Tanzanian Ministry of Health, Community Development, Gender, Elderly and Children and the Tanzania Food and Nutrition Centre in Tanzania—international agencies and donors, and community-level health workers.

## 1.2 The mNutrition intervention in Tanzania

mNutrition is a global initiative supported by DFID, organised by GSMA, and implemented by in-country mobile network operators (MNOs) and third-party organisations to use mobile technology to improve the health and nutritional status of children and adults in low-income countries around the world. mNutrition is implemented through mAgri and mHealth programmes in several countries throughout sub-Saharan Africa and South Asia. The nutrition content aims to promote behaviour change around key farming practices and around dietary and child feeding practices that are likely to result in improved nutritional health within a household.

In Tanzania, mNutrition is implemented through the 'Healthy Pregnancy, Healthy Baby' (HPHB) SMS text messaging service. The mass media programme accompanying the service is called Wazazi Nipendeni. The Wazazi Nipendeni programme is a US Center for Disease Control and Prevention (CDC) funded project bringing together multiple partners contributing towards shared goals. Phase 1 of the programme, launched in 2012, was initially developed in coordination with the Tanzania Capacity Communication Project (TCCP), a programme led by Johns Hopkins Center for Communication Programs (JHCCP). Wazazi Nipendeni was one of several behaviour change communication programmes using methods as diverse as TV drama series, radio distance learning for community health volunteers and several integrated mass media campaigns. The mass media campaign was developed by JHCCP, while the SMS component of the campaign was led by the mHealth Tanzania Public Private Partnership (PPP). The public-private partnership was initiated by the Ministry of Health and Social Welfare<sup>2</sup>, with financial support from CDC<sup>3</sup>. Wazazi Nipendeni is available nationally and on all phone networks.

The HPHB SMS Service sends free text messages with health care information to pregnant women, mothers with newborns, male supporters and general information seekers in Tanzania to drive health seeking-behaviour (Open Government Partnership, n.d.). The SMS messages are sent in Swahili, originally to women up to 16 weeks post-partum on a range of pregnancy and early childhood issues timed to the stage of the pregnancy and age of child. Anyone interested in receiving healthy pregnancy information and appointment reminders can text the word 'MTOTO' (child) to the short code 15001. Registrants receive instructional messages, allowing them to indicate the woman's current week or month of pregnancy (or the age of the newborn baby) during the enrolment process. This process allows the recipients to receive specific text messages relevant to the time and stage of pregnancy.

The mNutrition programme has supported mHealth projects in 8 countries through the development of nutrition content, and GSMA has assisted projects with product development primarily through user experience research business intelligence support. Nutrition related content was a small component of the original HPHB SMS Service but was extended substantially with the addition of content contributed through GSMA under the mNutrition programme. mNutrition adds roughly 120 nutrition messages delivered to caregivers of children up to five years old. The total received per week is 4-5 messages which cover a range of topics including malaria prevention, HIV, nutrition etc. however, the mix of messages received may vary over time depending on MoH campaigns, and that they should receive them until the child turns 5, unless they unsubscribe. The

<sup>2</sup> MoHSW has since been renamed the Ministry of Health, Community Development, Gender, Elderly and Children (MoHCDGEC).

<sup>3</sup> The Wazazi Nipendeni campaign and text messaging service is funded by the US President's Malaria Initiative and US President's Emergency Plan for AIDS Relief (PEPFAR) and implemented through US Government agencies [USAID](#) and CDC. It is run in coordination with the National Malaria Control Program, National AIDS Control Program and Health Promotion and Education Section. 'On the ground' health facility orientation support is also provided by the US Government, [Aga Khan Health Services](#) and Canadian International Development Agency. Other implementing partners include [Jhpiego](#), EGPAF, the Mwanzo Bora Program, [CCBRT](#), Tunajali Project, [PLAN International](#), Aga Khan Foundation and others.

resulting product will simply be referred to as Wazazi Nipendeni in the following sections of this report.

The original Wazazi Nipendeni text messaging service did not have the capability to deal with voice messages, but voice messages were developed as part of the local content development process in Tanzania. Under a separate agreement, GSMA subsequently commissioned HNI to incorporate the mNutrition content into their 321 service, provided in partnership with Vodafone. In contrast to Wazazi Nipendeni, the 321 service is a 'pull' type of service, whereby users dial a short code and navigate through interactive menus to find the information they are seeking. The system mostly plays audio clips to users, rather than sending SMS text messages. 30 IVR scripts were selected to be integrated into the 321 Health service, and were being recorded at the time of the baseline field visits.

### **1.3 Purpose and scope of the baseline report**

This report is a milestone in the evaluation study; it documents some of the journey of Wazazi Nipendeni in Tanzania supported by GSMA (and DFID) and takes a snapshot of the business model at the moment. The report is one of four baseline deliverables, each of which will be followed up by a final report at the end of the evaluation exercise in 2019. This report should be read in conjunction with the baseline Cost-Effectiveness Report (Batchelor, Sharp & Scott 2017). The Quantitative Baseline Report (Gilligan et al., 2017) and Qualitative Baseline Report (Barnett et al., 2017) give additional insights into the consumer environment that the service is targeted at.

The business model is constantly evolving. If we consider the last year, the Wazazi Nipendeni basic product which was focused on pregnant women, has been extended to include diet and nutrition content for children up to five years old. Wazazi Nipendeni is a part of a much larger strategy by the US Center for Disease Control and Prevention (CDC) and the Ministry of Health. The Wazazi Nipendeni product is run by the mHealth Tanzania PPP, which is currently managed by Cardno Emerging Markets, a private sector infrastructure and environmental services company who in turn are contracted by CDC. Wazazi Nipendeni currently enjoys the support of four of the Mobile Network Operators in Tanzania (Airtel, Tigo, Vodacom, and Zantel). At the time of writing, it has about 200,000 users, and has begun to push nutritional content to them. At the end of the data gathering stage (March 2017), Wazazi Nipendeni had developed its own platform for sending out messages, and GSMA had convened a workshop in Uganda for its mHealth partners, which prompted new thinking and an examination of the business model with the aim of strengthening its sustainability. This may lead to further changes in the product.

The findings from the four baseline deliverables described above will be combined and triangulated in a workshop planned for December 2017. The two-day workshop will examine the insights from the quantitative, qualitative cost-effectiveness and business modelling components of the evaluation and will be attended by the lead partners from IDS, IFPRI and Gamos responsible for each of these components. It will inform the development of the integrated mixed methods baseline report on the Wazazi Nipendeni mNutrition impact evaluation in Tanzania.

### **1.4 Organisation of the report**

After the description of the methodology in Section 2, Section 3 sets the scene in Tanzania including comment on the telecoms industry, Wazazi Nipendeni history and the nutritional context. The Wazazi Nipendeni product itself is described in Section 4, as well as key features lying behind this evolution. Each of the building blocks of the Osterwalder and Pigneur 'canvas' are then

described in detail in Section 5. Some insights into how other services are approaching the market in Tanzania are presented in Section 6, before an evaluation of the Wazazi Nipendeni business model itself in Section 7. This includes an assessment of each of the building blocks described using a range of criteria (scored using a Likert scale from -5 = very poor to +5 = very good); these scores are referred to throughout the report as key points are made. Finally, Section 8 draws key findings together to make some conclusions.

Throughout the report, some interesting learning points have been identified. Keeping an eye on these issues as the project develops over the next two years will enable more detailed insights to be made by the time of the final report. These preliminary learning points are described in the “Prelude to Learning” boxes, along with specific questions which have yet to be addressed. Further information on these issues will enhance the final reporting, both in terms of more detailed understanding of the business model, and compiling a narrative of how the model evolves over the duration of the evaluation.

## 2 Methodology

### 2.1 Aims of the Business Modelling baseline report

As will become evident from the narrative below, identifying and documenting all elements of a business model is not a simple process. The model itself constantly changes as the MNOs and other stakeholders get insights into the product and service, and in response to consumer feedback. This report is based on data gathering up to 31st March 2017. This was the end of the first official phase of data gathering. Given that the business model continually evolves, it provides a reasonable date for a snapshot of the business model, and insight into the possible trajectories. The Impact study team will continue to gather data and discuss with the relevant stakeholders the evolution of the business model, and the plan is to provide an endline in 2019 which links the insights into the business model with the insights into the impact on the users. Impact on the users is being gathered through an experimentally designed quantitative survey supported by qualitative data (DfID, 2017a).

This report is constructed from interviews with key stakeholders and access to secondary data. A list of contacts made during the baseline collection can be found in Annex B.

In the inception report, we stated that we would be using the Osterwalder and Pigneur canvas for structuring insights into the business model. Few business models in the 21st Century are straight forward and simple. Production of a product, sales of the product, and revenue from that product are only a small section of the overall model. Revenues are often made on associated advertising, or on the value the product adds to the brand. The landscape report, published as part of this study, details some of the possibilities for Mobile Network Operators (MNOs) (Barnett et al., 2016).

In this report, we use the Osterwalder and Pigneur canvas to provide structure. While this generally works well, we acknowledge that in this baseline, documenting the timeline and history of the product is important. These business model insights are intended to answer the key research question: “How commercially viable are the different business models being employed at country level?” (as well as contribution to the cost-effectiveness and the continued private sector engagement).

In a development sector where public funds are increasingly under scrutiny for value for money (VFM), the roll out of a public good via a private sector commercially sustainable mechanism is very attractive. The heart of the question is predicated on assuring that future actions taken by donors and private sector regarding similar products are informed and lessons are learned, in order to increase the chances of sustainability. Hence while we try to use the O&P framework in an applied manner, there are times when we need to document the ‘back story’ that led up to certain decisions.

The aim of this baseline report is, therefore, to provide a detailed description of each of the building blocks of the business model canvas as at the beginning of the independent study. It also provides a review of operating experience since the beginning of the mNutrition project that may provide context for changes that have already taken place in the product design.

### 2.2 Data collection methods

Business models traditionally describe how a business is going to make a profit from a product or service, and identify the direct relationship between the two. It considers who its customers are,

why they will buy the product or service (the value proposition), as well as how the company is going to provide the product or service. On the financial side, it considers both revenues (and pricing) and costs. The role of VAS within mobile network operators (MNOs) is not always straight forward. There are imputed benefits, and these are recognised as important within the DFID logframe for the whole GSMA programme. The challenge here then is to identify the broad business model including the non-monetary benefits of the service – to each stakeholder.

Given the complexity of the partnerships involved in the mNutrition projects, Osterwalder and Pigneur's (2010) inductive approach to business model generation is being used as a framework for the research.

The baseline has consisted of ongoing mixed data collection, drawing on:

- Qualitative interviews conducted with stakeholders in Tanzania
- Commercial data provided by stakeholders and MNOs (or aggregated by GSMA if necessary)
- Findings from the qualitative baseline research led by IDS, and quantitative baseline research led by IFPRI<sup>4</sup>
- Cost and impact performance data available in published literature
- Government stakeholders and alternative service providers as a source of additional, unpublished information on costs and impact.

The qualitative baseline research employed multiple data collection tools to explore four thematic areas:

1. Access, use and attitude towards, and acceptability of, mobile phone technology by mothers and pregnant mothers.
2. Barriers to, and facilitators of, the up-take of mobile-phone based messages by mothers and pregnant mothers.
3. Information needs and current information-seeking behaviours related to health and nutrition among pregnant women, breastfeeding mothers and mothers of young children.
4. Social, economic and environmental factors that may influence behaviour change related to nutrition.

Data collection tools included semi-structured in-depth interviews with mothers and pregnant women, key informant interviews (KIIs), expert interviews and community member interviews and focus group discussions (FGDs). Field work was carried out in two clusters of three villages selected from two different districts - Iringa Rural and Mufindi. Details of the sampling strategy, participant numbers and composition are described in the Qualitative Baseline Report (Barnett et al., 2017).

### **2.2.1 Process of information processing**

Evaluation activities carried out by Gamos to inform the baseline report include:

- Field visits to establish relationships with key stakeholders. Interviews conducted with key representatives of stakeholder institutions to gather additional data to populate the Osterwalder

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<sup>4</sup> The baseline report draws extensively from the qualitative baseline report because it was submitted earlier, however, this has not been the case with the quantitative baseline study, which was submitted at the same time as the business modelling baseline report.



and Pigneur (O&P) framework. Ongoing communication and field visits undertaken to monitor developments in services and to track the commercial justification for changes.

- Populating the Osterwalder and Pigneur (O&P) canvas with information gleaned from reports previously published under the mNutrition programmes (e.g. User experience testing, case studies, Rapid Feedback surveys, etc.), as well as grey literature.
- Working with IDS and IFPRI to contribute to the design of both qualitative and quantitative instruments (both baseline and endline) to incorporate indicators relating to non-financial attitudes of customers to services, and to MNOs in particular, such as customer satisfaction and brand loyalty. These instruments also explore attitudes towards alternative services offered by other providers, e.g. media, face-to-face extension.
- Interview alternative service providers to explore alternative business models (among alternative mobile services).
- The process of enquiry and information collection has needed (and will continue) to be flexible and responsive to events on the ground, given that the service offerings are constantly evolving. Particularly portentous times are expected to occur following the end of GSMA mNutrition contracts, for example. Other times might coincide with the publication of significant outputs from the research project that might be likely to inform product review decisions. This component of the evaluation is based on opportunistic data gathering from key individuals.

A number of evaluation activities have previously taken place, or are planned for the Wazazi Nipendeni service. These are to be conducted by different organisations with differing aims and objectives, each of which will be of value in informing the business modelling analysis. However, for the purposes of this baseline report, the end of March 2017 was taken as a cut-off point. While new information has arisen since this time, and continues to be given to the team even during the report writing phase, we have tried to restrict the baseline to that known as at March 2017 in order to create a clear boundary for the analysis.

## 2.3 Ethical considerations and approval

As an overall guiding principle, the research team sought to conduct themselves in a professional and ethical manner throughout the baseline phase of work, with strict respect for principles of integrity, honesty, confidentiality, voluntary participation, impartiality and the avoidance of personal risk. These principles were informed by the OECD (2010) DAC Quality Standards for Development Evaluation and DFID's 'Ethics Principles for Research and Evaluation' which will be followed for the duration of the evaluation.

Overall, this component will draw on the qualitative and quantitative data collected in the other two components of the evaluation. Other data sources will be stakeholder interviews with MNOs and data collection (commercial and monitoring data) from MNOs and other relevant organisations.

Although most research participants will be familiar with the mNutrition programme, and the principle of an independent evaluation, this component will seek informed consent of participants. This will be achieved by emails and briefing documents describing the research. In particular, it will describe the relationship between the consortium, DFID, and GSMA, in order to avoid any possibility of deception. Research activities with participants involve interviews only; there are no observational activities.

Whilst this evaluation component does not involve any primary data collection from human subjects at community / household level, ethical considerations are still considered important for all

work carried out under this component. In particular, GSMA remain highly aware of the commercial sensitivities of their partner MNO's, so the issue of commercial confidentiality is very important for this area of work given that it relies on sharing of sensitive commercial data. Therefore, the Gamos team will pay specific attention to this issue as part of their ongoing work.

The Gamos team is currently operating under the Non-Disclosure Agreement (NDA) signed by GSMA and OPM during the inception phase of the project. Where relevant, stakeholder respondents are informed that an NDA with their trade association has been signed, and that the interview is bound by it. All the data being gathered falls within the scope of this agreement (e.g. development, business plans, marketing, operations, and finances), although there is a provision that such information should be designated as proprietary or confidential<sup>5</sup>.

For the avoidance of doubt, all internal reports shared by Gamos are being marked as confidential and are not to be circulated outside of the evaluation team. Any outside reporting will not contain any detail that could be construed as proprietary or confidential information.

All external reports will be shared with key research participants in early draft form in order to establish principles of trust and reciprocity. This will ensure that participants will have an opportunity to confirm that their views have been reported accurately, and that publications do not breach their confidentiality requirements.

As this component draws on qualitative and quantitative data collected through the other two work streams, appropriate measures will be taken to ensure that the shared data is anonymised and there is no risk of confidentiality breach. For the quantitative data, a unique household ID has been assigned to each household which allows for following up with respondents as necessary without providing access to any personal information on datasets that are made available for analysis. Similarly, all qualitative transcripts are anonymised, pseudonyms given, and any information that can lead to personal identification has been removed.

## **2.4 Limitations**

The methodology relies on the willingness of key stakeholders to share their data and their thoughts. In a commercial environment, this is not always forthcoming, and a limitation of the report is that it relies on this shared data. Risks associated with this transfer of data have been mitigated as much as possible by clear communication and follow up with stakeholders.

As described above, this baseline is a snapshot as at March 2017. As the evaluation continues the product will evolve, new data may come to light and the business model itself may change. The risks associated with the evolving nature of the business model have been mitigated as much as possible by setting a milestone data point, and will use the subsequent phase to inform the changes between baseline and endline.

## **2.5 The Osterwalder and Pigneur framework**

The O&P framework is commonly used as a framework or canvas for describing a business model. Businesses in 2017 rarely have a simple model of selling a product and gaining revenue from that product. A simple income vs expenditure model rarely describes the business. Instead, a product might enhance the brand of a company, or enhance the overall experience of the consumer,

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<sup>5</sup> The agreement permits Gamos to share confidential information among the team if: 1. They need to know; 2. They have entered into a confidentiality agreement; 3. They are not a competitor.

causing them to buy other associated goods or services. This idea was at the very heart of the submission of GSMA to DFID. The logical framework of the GSMA grant application, described in the next section, discusses indirect benefits or imputed benefits.

In order to map the various components of the business model and to capture these indirect or imputed effects (beneficial or otherwise), we use the O&P canvas. The nine elements (or building blocks) of the canvas form the basis of our analysis below. Note that we propose amending the framework slightly by splitting the Revenue building block into two components, considering cash generated and imputed benefits separately, and splitting Costs into two, considering operating costs and previous investments separately. This has been proposed because of the importance of indirect costs to VAS business models, and because some of the key resources brought to partnerships have benefited from prior investments. Table 1 presents a generic overview of the framework, i.e. the descriptions and example questions illustrate how the framework is applied to business models in general, so not all are directly relevant or applicable to the Wazazi Nipendeni service.

**Figure 3 Building blocks in the canvas (derived from Osterwalder and Pigneur (2010))**



*Authors own*

**Table 1 Description of Building blocks in the canvas<sup>6</sup>**

Canvas building block	Description	Example Questions
<b>Customers</b>		
Customer Segments	The business model should define different groups of people or organisations to reach and serve. Distinct segments will have common needs, behaviours, or other attributes. The business model should be designed around a strong understanding of customer needs.	For whom are we creating value? Who are our most important customers?
Channels	How a company communicates with customer segments. Channels are customer touch points that shape the customer experience, e.g. communication, distribution, sales.	How are we reaching customer segments? How do they want to be reached? Which ones work best and are most cost-efficient?

<sup>6</sup> Authors' table, generated from Osterwalder and Pigneur (2010).

Canvas building block	Description	Example Questions
Customer Relationships	The types of relationships a company establishes with specific customer segments. Relationships may be driven by various motivations, e.g. customer acquisition, customer retention, boosting sales.	What type of relationship does each of our Customer Segments expect us to establish with them? How costly are they? How are they integrated with the rest of our business model?
<b>Offering</b>		
Value Propositions	The bundle of products and services that create value for a specific Customer Segment by satisfying a need or helping solve a problem. Value propositions may be innovative (disruptive) or similar to others, but with added features.	What value do we deliver to the customer? Which of our customers' problems are we helping to solve? Which needs are we satisfying?
<b>Business Operations</b>		
Key resources	Those assets required to make the business model work. Resources that allow and enterprise to create and offer the value proposition, to reach markets, to maintain relationships, and to generate revenues. They can be physical, financial, intellectual, or human.	What key resources do value propositions require?
Key activities	Things a company must do to makes its business model work. Activities required to create and offer the value proposition, to reach markets, to maintain relationships, and to generate revenues.	What activities do you value propositions require?
Key partnerships	The network of suppliers and partners that make the business model work. Companies forge partnerships for many reasons, e.g. reduce risk, acquire resources.	Who are our key partners? Who are our key suppliers? Which key resources are we acquiring from partners? Which key activities do partners perform?
<b>Finances</b>		
Revenue streams	The cash generated from each Customer Segment. Revenue streams will depend on what customers are willing to pay. Revenue streams can be either one-off payments, or recurring revenues. Each revenue stream may have different pricing mechanisms.	For what value are customers willing to pay? How are they currently paying? How would they prefer to pay? How much does each revenue stream contribute to overall revenues?
Cost structure	Costs incurred to operate the business model. Creating and delivering value, maintaining customer relationships, and generating revenue all incur costs.	What are the most important costs inherent in our business model? Which key resources are most expensive? Which key activities are most expensive?
Investment	Number of investors, type of investors, and commitments made to investors. These will influence acceptable profit margins, and may affect cash flow.	Who has invested in the company? What kind of returns are expected? And over what timescales?
Indirect benefits	Ways in which the service can benefit the company other than by direct revenue generation.	How does service increase acquisition and loyalty? Does service boost other sales? How does service improve brand image?



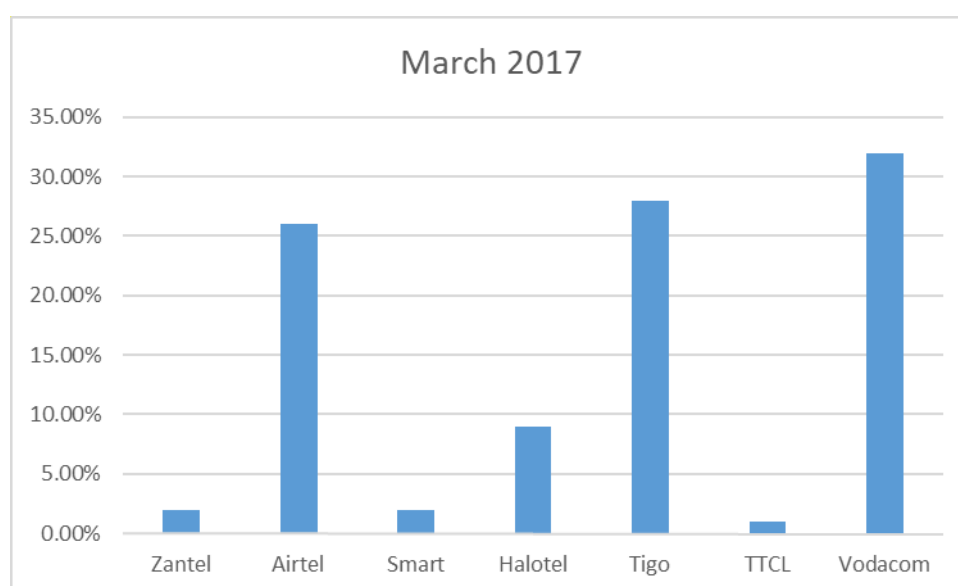
### 3 Setting the Scene – Tanzania

#### 3.1 Telecoms in Tanzania

Much of the general telecom landscape has been covered in Dial N for Nutrition (Barnett et al., 2016). GSMA summarise the Tanzanian markets as “a Discoverer market in Eastern Africa with 8 operators and 38.6 million mobile connections”<sup>7</sup> (Q4 of 2015). According to the latest figures published by the regulator (the Tanzania Communications Regulatory Authority, TCRA), the total number of voice subscriptions had risen to 40 million in March 2017<sup>8</sup>. Given that the population is 56 million (increasing by 3.1% per year), this represents a penetration rate of 71%. TCRA figures show that growth is slowing down; from January 2015 to January 2016, subscriber numbers grew by 22.4%, but over the following 12-month period, growth slowed to 0.3%.

The market is served by 8 MNOs: Airtel (Bharti Airtel), Halotel (Viettel), Smart, Smile, Tigo (Millicom), TTCL, Vodacom, and Zantel (Millicom). Although Vodacom has the largest market share at 32%, the majority of the market (86%) is quite balanced between the three main operators (Vodacom, Tigo, and Airtel) – see Figure 4. Over the period January 2016 to January 2017, Halotel has shown huge growth, more than doubling its subscribers; among the main operators, Tigo grew slightly (2%), and Airtel and Vodacom both shrank slightly (by 5% and 1% respectively).

**Figure 4 Market share of voice subscribers (March 2017, derived from TCRA data)**



*Authors own*

Mobile financial services are a key feature of the Tanzania telecoms market. Not only are subscription rates high (19.2 million mobile money accounts in March 2017 (TCRA)), but Tanzania was the first African country in which the main mobile money operators (Vodacom, Tigo, Airtel, and Zantel) collaborated to make their platforms interoperable (in 2015).

Internet penetration continues an upward trend, and latest data published by TCRA gives an estimate of 20 million internet users (representing 40% penetration in 2016), which are dominated by mobile wireless. ITU figures are more conservative, putting the estimate of internet users in

<sup>7</sup> GSMA Intelligence

<sup>8</sup> <https://www.tcra.go.tz/images/documents/telecommunication/CommStatMarch17.pdf>



2016 at 7.6 million<sup>9</sup> (representing 15% penetration). Increasing internet use, especially through smartphones, suggests that rich interaction applications will displace SMS as the most appropriate means of disseminating information, but not in the near future. A neutral score (of -1) has been given in Table 4 for the threat posed by new technologies.

## 3.2 Wazazi Nipendeni history

The Healthy Pregnancy, Healthy Baby programme, also known as Wazazi Nipendeni ('Love me, parents') was a multimedia campaign launched in 2012 that included posters, brochures, TV advertisements, radio spots, billboards, radio jingles, and so on. The campaign was convened by various programmes under the Ministry of Health and Social Welfare, and coordinated with the Tanzania Capacity and Communication Project (TCCP), run by Johns Hopkins Center for Communication Programs. A text based messaging service was just one component of the campaign, which was developed by the mHealth Tanzania Public Private Partnership (PPP) and funded by CDC, and has now become known as Wazazi Nipendeni. The mHealth Tanzania PPP (renamed in 2011) was itself something of a legacy from an earlier mHealth project called 'Phones for Health', which dated back to 2007. The mHealth Tanzania PPP itself is, as the name suggests, a partnership between government, NGOs, and private sector companies. It is a small group with specific skills needed to broker partnerships needed for the design and delivery of health content. It has been funded by PEPFAR (the President's Emergency Plan for AIDS Relief) through CDC, but management has since been contracted out to Cardno. The PPP has developed a number of systems in Tanzania – Electronic Integrated Disease Surveillance and Response (e-IDSR), a national blood transfusion messaging service, an early infant diagnosis system, and then the Wazazi Nipendeni text messaging service.

The text messaging service was launched in November 2012 and scaled up rapidly, reaching 100,000 women within 11 weeks of the launch. The campaign was run nationwide, using national and regional TV and radio stations. The SMS text service was also available nationwide, at least through the self-registration access pathway. The assisted registration pathway depends on working with partners with a presence on the ground who can provide the face to face contact with women that is needed.

Phase 1 of the campaign addressed a range of thematic areas intended to improve maternal and child health outcomes, such as malaria in pregnancy, antenatal care attendance, HIV testing and prevention of mother to child transmission enrolment (PMTCT), and safe deliveries. Phase 2 of the campaign was launched in 2015 and expanded the range of materials to cover post-partum care for children up to 1 year of age.

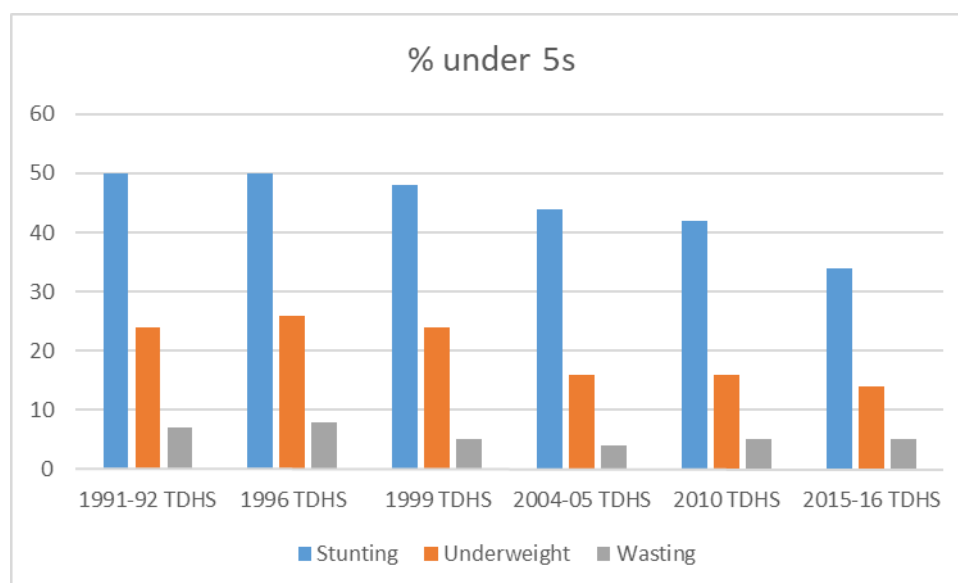
## 3.3 Nutrition context

This brief overview of the nutrition and peri-natal health context in Tanzania is based largely on Barnett and Srivastava (2016), which draws on data from a number of sources. Most recent data indicate levels of stunting in under 5s is around 34% (MoHCDGEC 2016). However, studies indicate that Tanzania is making progress on nutrition indicators, such as the UNICEF's Child Poverty Report (2016), which shows that stunting has reduced from 40% to 34% (among children under 17 years of age) over the four year period from 2009 to 2013. This positive trend is also evident in the latest data published by DHS – see Figure 5. Micronutrient deficiencies remain a

<sup>9</sup> <http://www.internetworldstats.com/af/tz.htm>

challenge with approximately 43% of children aged between 6 and 59 months being Vitamin A deficient and one third deficient in iron.

**Figure 5 Trends in Children's Nutritional Status (% under 5s) (derived from MoHCDGEC 2016)**



*Authors own*

While 10% of women are thin (BMI<18.5), almost three times that number are overweight or obese (BMI≥25) (MoHCDGEC 2016). One third of women of reproductive age (15-49) are deficient in iron, vitamin A and iodine, and two fifths of women are anaemic (Barnett & Srivastava 2016). A more immediate and linked priority among women is maternal mortality, given that the current rate lies around 400 deaths per 100,000 live births (GAIN 2014). This indicates there is a long way to go before the country will achieve the target under MDG 5 of 133 deaths per 100,000 live births (Kilama et al., 2016).

Poor nutrition in under 5s is partly due to sub-optimal breastfeeding practices, and to poor quality of complementary foods. Although complementary foods are generally introduced in a timely manner, meal frequency and dietary diversity are poor. Poor nutrition more generally is linked to food insecurity and limited access to nutritious food (e.g. due to poor economic status). Most households have only two meals per day, consisting of only two food groups per day, typically cereals and vegetables.

Malaria is the leading cause of morbidity among under 5s, and is a largely rural phenomenon. It is also estimated that 4.7% of adults of reproductive age (15-49 years) are HIV positive, and 91,000 children (0-14 years) were living with HIV in 2015. In addition, it is estimated that 46% of Tanzanians do not have access to safe drinking water, and 87% no access to improved sanitation.

Over recent years, the Government of Tanzania has signed up to various initiatives surrounding maternal and reproductive health, and nutrition in particular has become more of a priority for the Tanzanian Government. Policy initiatives are outlined in Section 5.9.8, which also mentions ways in which Wazazi Nipendeni has linked to government bodies tasked with implementing nutrition strategy. Tanzania joined the Scaling Up Nutrition (SUN) Movement in 2011, and public expenditure on nutrition has increased over recent years (Barnett & Srivastava 2016).



## 4 Wazazi Nipendeni

### 4.1 The Vision

There are three key visions that need to be considered when discussing the sustainability of the business model.

#### GSMA vision

As alluded to above, the GSMA (and DFID) vision was for something different in mHealth. They had seen many mHealth pilots that utilised mobiles and smart devices to strengthen the health system of various countries and to offer a consumer facing product. Many pilots existed, but few if any scaled activities that were coordinated with the health service nationwide. The Terms of Reference state that under the mNutrition programme, GSMA are to provide assistance to MNOs and partnerships to scale up services (Annex A); DFID's vision, then, was to create a service that could achieve scale by being made available to MNO subscribers.

In Wazazi Nipendeni and their early work on pregnancy messaging and support, they found a group that fulfilled their aspirations. This group already had a service working with every MNO but one, and they had in place the institutional framework to expand their operations to include nutritional messaging. The group also had deep connections into the government, and as such looked as though it could be a service that was the fulfilment of the GSMA vision, i.e. on a trajectory to be embedded in the National health service.

#### Wazazi Nipendeni vision

Wazazi Nipendeni themselves were working with, and continue to work with, the Government of Tanzania. Wazazi Nipendeni is one of many Public Private Partnerships designed to support the Tanzanian health system. The mHealth Tanzania PPP are proud of their status as a not-for profit partnership. Their vision is focused on the health outcomes of the service.

#### MNO vision

As stated above, Wazazi Nipendeni can be accessed through any of the four Mobile Network Operators. These MNOs zero rate text messaging for the service. This arrangement has been made as four bilateral agreements between the Wazazi Nipendeni team and each MNO, in all cases through the Corporate Social Responsibility Unit. For Vodafone, this means the zero rating is charged by Vodacom Tanzania but billed to and paid for by Vodafone Foundation. For Airtel, until the February GSMA workshop, the zero-rating sat with the network team, who had just set the messaging to zero rating on behalf of CSR and seemingly almost forgotten it.

The vision, then, for the MNO is almost non-existent. From its inception, they have not regarded Wazazi Nipendeni as a commercially viable proposition. They simply see this as part of their corporate social responsibility (CSR) and until the last three months have not seriously considered how this product might enhance their profile, or contribute to their profits.

Sustainability then, for Wazazi Nipendeni, is more complex than for example, the Vodafone Farmers Club in Ghana. As will be seen below, Wazazi Nipendeni's institutional backing is relatively assured for the next few years, and its transfer into the government system is a sign that the Government has some commitment to it. However, for each MNO, there has not yet been a coherent discussion of how the product enhances their bottom line, and whether the product is 'commercially sustainable'.

## 4.2 Adaptation and key performance indicators

The current mNutrition product in Tanzania is substantially different to that originally conceived. The original vision (promoted by GSMA) was for a convening space, or clearing house, to be created, which any party interested in providing health related services could subscribe to. The complexion of the institution that would manage the clearing house was not specified. It could be some kind of collaborative membership format, in the same way that internet exchange points are generally managed by associations comprising members representing each peering ISP. It could be managed by a private sector organisation, typically an aggregator, as it would require an aggregator to set up the links to each of the MNOs in the country. The key feature of this vision was that it would lower the barriers of entry to mHealth services – the infrastructure and agreements with MNOs would already be in place so any institution could use the arrangement to send mobile based information at relatively low cost. By creating a focal point for mHealth services operating within the country, it would also promote coordination, collaboration, and sharing of resources, thereby helping to address the all too frequent complaint of duplication of effort. A different mix of partners in each country would enable local capabilities to be deployed, and help ensure that the services provided reflected local needs. By devolving responsibility for content, including the nature of services to be made available by participating organisations, the concept had the potential to support the dissemination of diverse content, and to support innovative mechanisms for reaching resource-poor mobile phone users.

The system would work as follows:

1. The managing institution would secure a short code valid on all networks.
2. The first time users would dial into the system, they would be guided through a series of menus and questions to complete their profile. They would then be routed to relevant information based on their profile (e.g. gender, pregnant mother, or mother of child under 2). Once routed to relevant menus, they would be presented with options on which type of information they wanted to receive, and within that type of information, they could choose from relevant content providers.
3. Once they had chosen the content provider, the profiling information would be sent to that content provider, and the user would be signed up to that partner's service (which may or may not include further profiling).

This shows how each participating organisation was expected to provide their own content, and to be responsible for managing and validating their own content. In this way, the concept largely absolved the managing institution of the need to make content available, and of responsibility for validating content, as this would all be part of the expertise provided by participating organisations. As a minimum, it was expected that the system would provide the following suite of services:

- Messages on nutrition
- General health content (push) – chosen from a selection of health topics
- General health content (pull) – on demand browsing of a range of health topics
- Talk to a doctor – ability to speak to a healthcare professional
- Mobile financial services

Services were to be made available on a freemium basis, i.e. certain information was to be available to users for free, and they would need to pay for other, premium content. The nutrition

messages, generated as part of the GSMA mNutrition programme, were to be made available as free messages. Even within the services provided by participating organisations, it was expected that some level of service or information would be made available for free, and mHealth service providers would be able to generate revenue by charging for premium services.

In early 2015, GSMA were negotiating with Green Telecom, a Tanzanian private sector company that had been founded for just over a year. It appeared to offer a good fit with the kind of partner that GSMA were looking for, as it had links to each of the mobile operators, and was in the business of developing low cost mobile solutions to enable their clients to reach consumers. The company was formed as a result of a merger between an aggregator and a platform developer, so they had all the technical skills needed. Green Telecom were keen to do the job, as they would then be able to use the mNutrition project to demonstrate their capabilities, which would be of immense value to a relatively new company. In the end, however, GSMA entered into a partnership with Wazazi Nipendeni, which had a proven track record in delivering SMS content to mothers.

The original concept was ambitious, and centred around getting potentially competing organisations to collaborate, which is a time consuming business. Eventually, timescales conspired against that concept, and in the first wave of countries, GSMA entered into what might be regarded as more conventional partnerships with mobile operators. The partnership in Tanzania with the Wazazi Nipendeni product is something of an exception to this rule, as it is hosted by a public private partnership that, although it has agreements with mobile operators, is independent of any single MNO.

### 4.3 The Wazazi Nipendeni Service

The 'Healthy Pregnancy, Healthy Baby' (HPHB) SMS Service sends free text messages with health care information in Swahili to pregnant women, mothers with newborns, male supporters and general information seekers. The system sends 4 messages per week that are tailored to be relevant to the woman's stage of pregnancy, or the age of her newborn child.

The aim of the original service was to encourage women to avail themselves of health services targeted at improved neonatal health outcomes. The original content covered a range of pregnancy and motherhood topics such as antenatal care, family planning, malaria prevention, prevention of mother to child transmission of HIV/AIDS, post-partum care. Messages covered pregnancy and up to 16 weeks post-partum. Messages were designed to be consistent with advice given by health workers in the field so that there is a reinforcing effect between text messages and advice women receive from elsewhere. Within this content there were a number of messages related to nutrition. The GSMA mNutrition project provided an opportunity to strengthen that content and to supplement it with a substantial additional body of nutrition content. This content was added in two phases. Firstly, 31 messages were added that coincided with the scope of the original Wazazi Nipendeni messages then at a later stage, a further 128 messages were added, covering life stages up to 5 years. This appeals to MNOs, as it potentially extends the period of engagement with a mother (or other user). An official launch of the revised service, including the expanded nutrition content, is scheduled for August 2017. This will provide an opportunity to present the new service (and content) to the health community, particularly institutions working in nutrition, with a view to attracting a new set of organisations to engage with the service as implementation partners.

The service is free to users, and is available to any subscribers anywhere in the country where the partner MNOs have network coverage. There are 3 ways of registering for the service: self



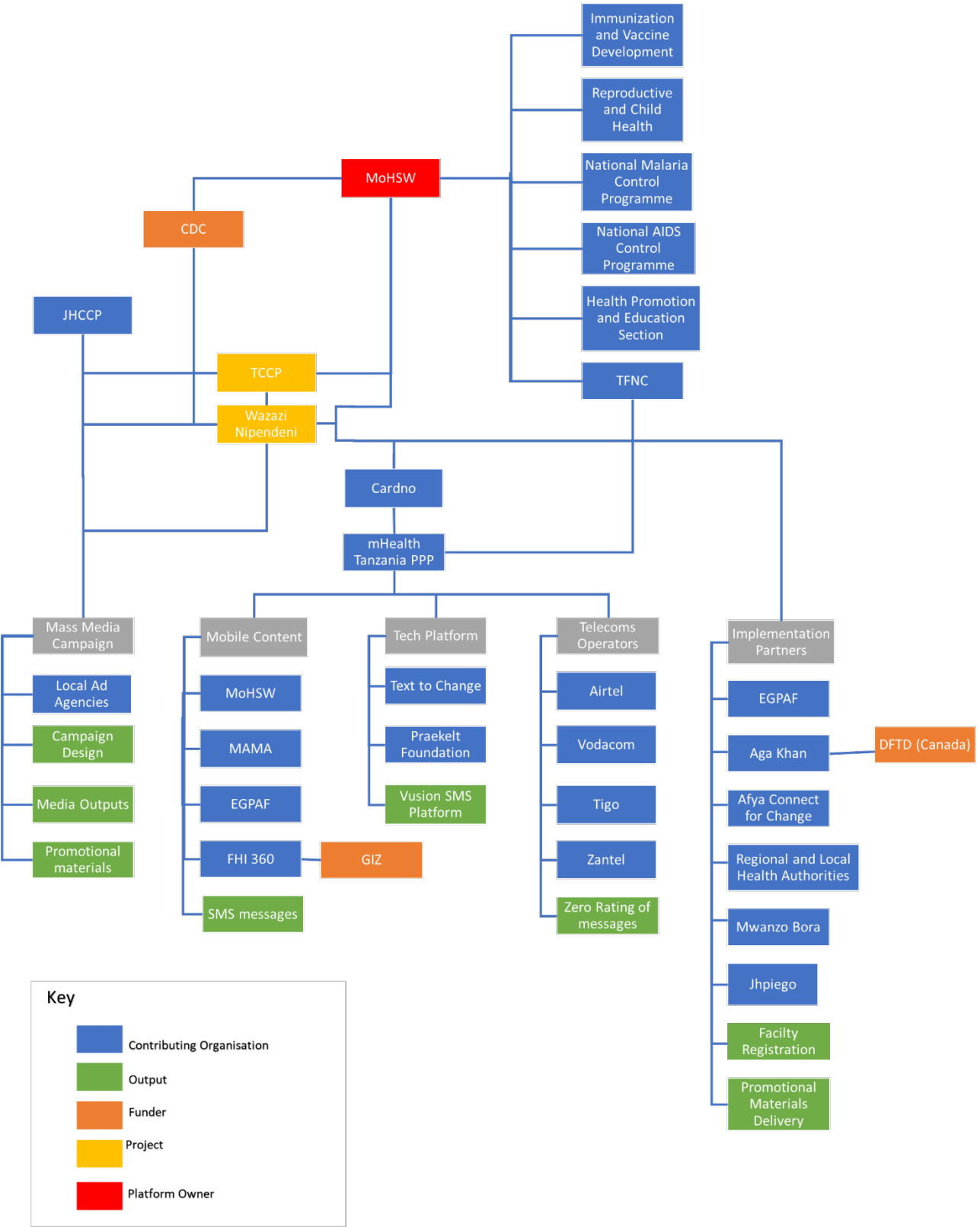
registration by texting the word 'MTOTO' to short code 15001, registration by a health facility worker (when woman visits a facility), and registration by a community health worker (when the worker visits a woman in her home). Assisted registration is facilitated by staff in government health facilities, and by trained representatives of implementation partner organisations. The registration process asks people to indicate the woman's current week or month of pregnancy (or the age of the newborn baby), so that messages can be scheduled to match the stage of development of the pregnancy or the age of the child.

The mHealth Tanzania PPP has evolved as a group with expertise in brokering partnerships, which are a defining feature of the Wazazi Nipendeni service (see history in Section 3.2). Partners fall into a range of categories (represented in Figure 6):

- Ministry of Health – multiple departments within the Ministry have convened various initiatives supported by Wazazi Nipendeni throughout its evolution. The TFNC is currently operating as a core partner in the mHealth Tanzania PPP, which provides synergy with the expanded nutrition content provided by the mNutrition programme. Wazazi Nipendeni, as an mHealth service, offers a good fit with the Ministry of Health's eHealth Strategy, and supports the government's commitments under the Open Government Partnership.
- Content providers – over the course of multiple initiatives, various organisations, mostly NGOs, have assisted with development of content to augment the Wazazi Nipendeni database; this includes a number of Ministry of Health departments.
- Mass media organisations – have worked with content partners to generate multi-media outputs; this was largely funded by JHCCP under the Tanzania Capacity and Communications Project.
- Telecoms partners (Airtel, Tigo, Vodacom, and Zantel) – provide zero rated SMS messages at the heart of the system. This represents the largest single cost item of the service, if valued at market rates for SMS messages. The four largest MNOs in the country have partnered with Wazazi Nipendeni; messages are funded through their CSR departments and the Vodafone Foundation.
- Technology platform – the service was originally facilitated by the open source Vusion platform provided by Text to Change, originally a non-profit<sup>10</sup>. However, this system had a number of shortcomings, many of which were a consequence of the technical setup (see Section 5.9.5). In October 2016 the system migrated to a new platform commissioned by the Ministry of Health, funded by CDC, and provided by Tanzanian company, Rasello.
- Implementing partners – operational organisations running health campaigns in various parts of the country. The content provided by Wazazi Nipendeni supports their campaigns. Their field presence enables them to enrol people in the system.

<sup>10</sup> Text to Change has since changed its status to a for-profit social business.

Figure 6 Organisations involved in Wazazi Nipendeni



Authors own

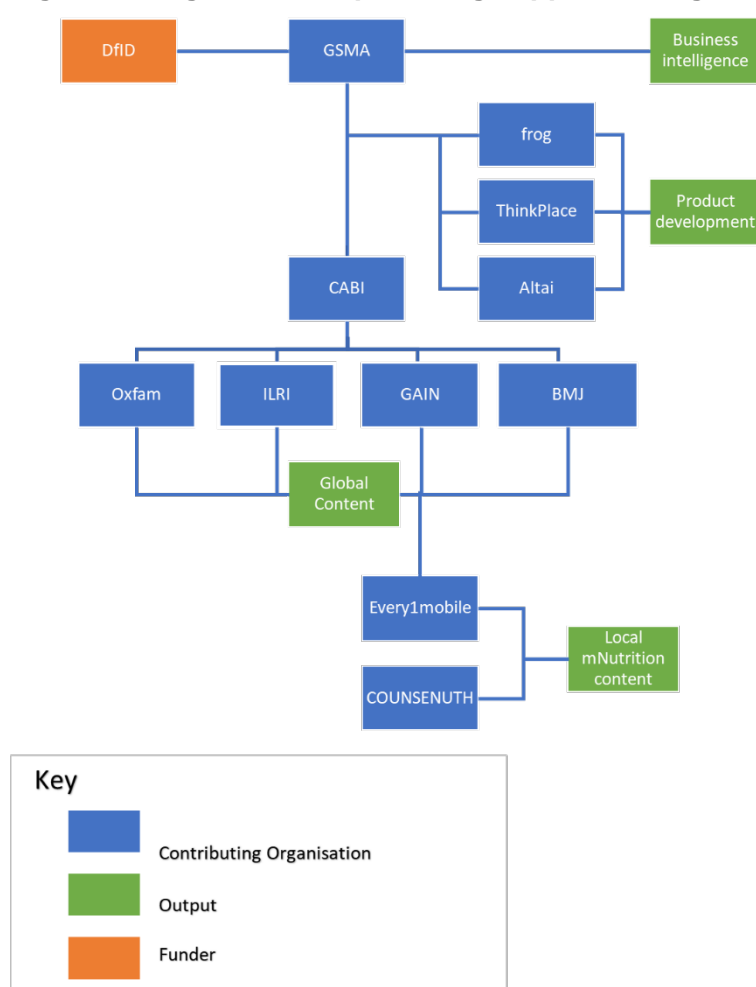
## 4.4 The mNutrition Programme

DFID funding channelled through the mNutrition programme provides support for mHealth programmes in two ways:

- Development of locally relevant health and nutrition related content. At the end of the content development process, partners can access tested and approved messages in a 160 character format. A Global Content Partnership supported Local Content Partners to prioritise nutritional information needs and ensure that information aligned with national policies and processes, to make sure messages were locally relevant and accessible, and to set up robust quality control procedures.
- Product development. GSMA have provided funding for a range of user experience design and testing assignments (by frog and Thinkplace) as well as ongoing monitoring activities (by Altai). GSMA itself has also provided business intelligence support. All of these have provided valuable insights that have help further refine the messages and the service itself.

Key institutions involved in delivering support to Wazazi Nipendeni are represented in Figure 7. Note that the mNutrition programme made no direct grants to the mHealth Tanzania PPP or other partners in Wazazi Nipendeni.

**Figure 7 Organisations providing support through the mNutrition programme**



Authors own

## 4.5 The Future

GSMA support to the Tanzania mHealth PPP through the mNutrition programme is due to be concluded by August 2017. After this time, GSMA will continue to provide technical support, particularly on monitoring and evaluation activities. Support through the mNutrition programme is due to cease by mid-2018.

Features of the original clearing house concept for the mNutrition partnerships that are absent from the Wazazi Nipendeni partnership include a mechanism for generating revenue directly from the service, and the engagement of a private sector organisation, over and above the support provided to the programme by the MNOs. GSMA have been concerned about the implications of this for the longer term commercial sustainability of the product, and have taken steps to stimulate new thinking among key stakeholders. In January 2017, they convened a meeting of mHealth partners specifically to discuss commercial sustainability. They have also been liaising directly with stakeholders to prompt new thinking and to explore innovative options for generating revenue. This includes discussions with representatives from government departments that are engaged with the Wazazi Nipendeni product. At present, the government have insisted that health information should be disseminated free of charge, but they are actively considering innovative ways of generating revenue other than from the end users themselves. All of this means that in the near future, substantial changes are likely to take place in the business models in place behind the Wazazi Nipendeni service.

## 5 The Canvas

The building blocks of the canvas were introduced in Section 2.5, but the order in which they are addressed in this section follows a certain logic implicit in the original book by Osterwalder and Pigneur. The starting point of any business is the Customers to be served. The Value Proposition must then be designed to meet those Customers' needs, and will be delivered through various Channels. Customer Relationships will be largely influenced by Channels through which the organisation engages with Customers. Finally, the business model will want to extract Revenue (or Indirect Benefits) from Customers. Key Resources cover everything needed to carry out the Activities required to deliver the Value Proposition to Customers. These Resources may be sourced through Partnerships, and indeed some Activities may be performed by Partners. Finally, there will be Costs incurred in delivering the Value Proposition to Customers. So the first part of the canvas deals with Customers (Sections 5.1 to 5.6), and the second part looks internally at how an organisation delivers the Value Proposition to Customers (Sections 5.7 to 5.11).

### 5.1 Customer Segments

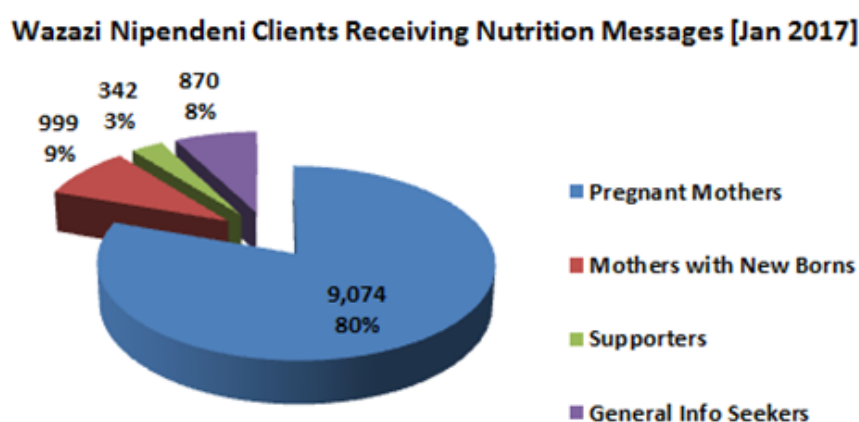
*“The business model should define different groups of people or organisations to reach and serve. Distinct segments will have common needs, behaviours, or other attributes. The business model should be designed around a strong understanding of customer needs.” (Table 1).*

The Wazazi Nipendeni service explicitly accommodates four categories of users:

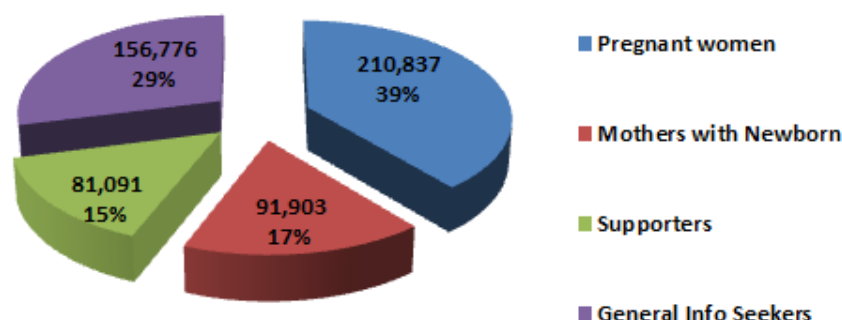
- Pregnant women
- New mothers
- Supporters (of pregnant women or young mothers)
- General interest

A recent monthly report shows that pregnant women (labelled as 'pregnant mothers') are clearly the largest category of users (see Figure 8). However, the mix of users over a previous ten-month period was more balanced – see Figure 9.

**Figure 8 Mix of Clients (January 2017, GSMA 2017)**



*Reproduced with permission*

**Figure 9 Mix of Clients (February to October 2016) (Blomberg 2016)****Total Nutrition Users Breakdown [ Feb to Oct 2016]**

*Reproduced with permission*

The qualitative research found that in the field study areas, only 3 out of 10 women were estimated to own a mobile phone. Men are more likely to own phones because phones are more likely to be useful for their income generating activities. Men were reluctant to let their wives have phones, fearing they would be used to facilitate affairs, and women themselves recognised that phone ownership can cause problems in the family because of trust issues. Some women owned a SIM card, if not a phone, and many women could access phones from husbands or neighbours, but this appears to be restricted to emergencies.

Among young, married women, who are the primary Customer Segment, it tends to be husbands who control their access to phones, either through consent to ownership, by buying a handset / SIM for their wives, or by sharing their own phones with their wives. The qualitative research found that husbands also control who their wives are permitted to call, or may insist that women make calls in the presence of the husband. Husbands are, therefore, a key Customer Segment, and indeed are accommodated in the Wazazi Nipendeni service as Supporters of pregnant women. Moreover, men are clearly targeted in the Wazazi Nipendeni campaign materials, which focus on the role of couples in bringing up children (some examples are given in Figure 10). However, Figure 8 indicates that Supporters, the category that includes husbands, make up only a small proportion of Wazazi Nipendeni users.

**Figure 10 Campaign materials are targeted at couples (Johns Hopkins Center for Communication Programs)**

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This is in contrast with findings from the qualitative research that men are generally supportive of receiving messages on nutrition and child health, and women can see advantages of husbands receiving messages. Women felt that sending messages to men would help engender a sense of responsibility for health and nutrition in the family, which is key to improved nutrition, given that it is men who are the main decision makers regarding food to buy and crops to grow (Frog 2016). Men recognised that the efficacy of messaging could be improved by sending messages to both husbands and wives, as they would then be more likely to discuss issues, although there was no suggestion that messages should be sent to men in preference over women. One of the personas identified by the user research was the Caretaker, a young married man starting his family (ThinkPlace 2016). One of the features that came across from this persona was the importance to this man of his family, and the importance to his male identity of being able to provide for his family, which could extend to health and wellbeing. *"Men are more than supporters, they are a key for behavioural change."* (Frog 2016). If this is the case, then it would be interesting to break down the Supporters by gender, and to explore the reach of the service among men. A fairly neutral score of -1 has been given in Table 4 for matching of both value proposition and channels to customer segments because it is not clear from the data available at this point that the service is reaching men, nor that men are sharing information with women.

The quantitative research specifically addresses these gender issues and is designed to explore the impact of actively engaging men in health messaging on health outcomes. It will include a second stage of randomisation in which households where both pregnant women and their partner own distinct mobile phones will be split into two groups – in one group only the woman will receive the messages, and in the other group men and women will both receive messages (Gilligan et al., 2017).



The qualitative research found that unmet nutritional information needs are particularly great among first time mothers and pregnant adolescents. Teenage pregnancy rates are high in Tanzania: *“About one in 20 girls in Tanzania have begun child-bearing when they are only 15 years old, and this rises sharply to one in four among 17 year olds.”* (The Children’s Agenda. Advocacy Brief - Teenage Pregnancy<sup>11</sup>). Moreover, health outcomes among both mothers and children are poorer among teenage mothers. Teenage girls find it more difficult to access antenatal care, especially if trying to hide a pregnancy, for example, or if they have no husband. Neonatal death rates among babies born to teenage mothers are twice that among mothers in their 20s, and illegal abortions are thought to be a significant cause of death among teenage girls (ibid.). Further research is needed to determine whether this particularly vulnerable group is accessing the Wazazi Nipendeni service. Although the messages are tailored to the stage of pregnancy or age of child, all users receive the same content, irrespective of category of user described above, or sub-category of user, such as pregnant teenager, so a negative score (of -3) has been given in Table 4 for segmenting of customer base.

There is no evidence from Wazazi Nipendeni literature that the text service, or the campaign itself, has a particular poverty focus – it is not specifically targeted at poor or rural families. As a national service available through multiple networks, the text messaging service is available all across the country, wherever there is network coverage. Having said that, the quantitative research component of the evaluation is conducting a cluster randomised control trial among resource constrained households in Iringa region: “on average, there is 58.1% chance that sample households are below 150% of the national poverty line and a 77.2% chance that the households live on less than \$2.00 per day in 2005 US dollars” (Gilligan et al., 2017). The evaluation will, therefore, generate evidence of the impact of the service on low income groups, and even this sample can be disaggregated by poverty groupings.

The fact that the service is text based will mean that it is likely to be of limited value to illiterate sections of the population. Although adult literacy rates for the population as a whole are around 80%<sup>12</sup>, rates are much higher among the young - literacy among young women (aged 15-24) was 85% (2012)<sup>13</sup>. This still leaves a substantial part of the potential target group who may be unable to access the Wazazi Nipendeni service.

From the mHealth Tanzania PPP’s point of view, their main customer is CDC, who fund the operation.

### **Prelude to Learning**

All the research suggests that men are key targets in order to maximise behaviour change, and although campaign materials are clearly aimed at couples, it is not clear if they are specifically targeted by field agents who actively promote the service and manage assisted registrations.

Are teenage girls making use of the service, and do they value it more / less than others?

<sup>11</sup> <https://www.unicef.org/tanzania/AdvocacyBrief-TEENAGEPREGNANCY-spread.pdf>

<sup>12</sup> <http://data.worldbank.org/indicator/SE.ADT.LITR.ZS?locations=AF>

<sup>13</sup> <https://www.indexmundi.com/facts/tanzania/literacy-rate>

## 5.2 Value Proposition

*“The bundle of products and services that create value for a specific Customer Segment by satisfying a need or helping solve a problem. Value propositions may be innovative (disruptive) or similar to others, but with added features.” (Table 1).*

This section provides some additional detail on the service (beyond the general description in Section 1.2). It then considers value added specifically by the mNutrition programme (through content generation and user experience research). Next it highlights key features of the product (timeliness and how it complements field services), and it ends by discussing what is known about nutritional information needs.

### 5.2.1 The Wazazi Nipendeni Text Messaging Service

The original Wazazi Nipendeni multimedia campaign directed women to health services, and to the text messaging service. The aim of the original SMS content was to encourage women to avail themselves of health services targeted at improved neonatal health outcomes, and this is still the case. This original content covered a range of pregnancy and motherhood topics, and included a number of nutrition related messages. The GSMA mNutrition project provided an opportunity to strengthen that content and to supplement it with a substantial additional body of nutrition content. Nutrition content has been added in two stages. Firstly, 31 messages were added that coincided with the scope of the Wazazi Nipendeni existing messages (covering pregnancy and up to 16 weeks post-partum). Later, a further 128 messages were added, covering life stages up to 5 years.

The key pregnancy health behaviour is making antenatal care visits, as this provides contact with health workers who can then administer treatments, such as giving SP<sup>14</sup>, which is an intermittent preventative malaria treatment given during pregnancy. They can also conduct diagnostics such as HIV testing, encourage healthy behaviours such as use of bed nets, and work with women to encourage them to adopt safe delivery practices, for example through birthing plans. Subscribers to the text messaging service receive an average of 3-4 messages a week across several safe motherhood topic areas. The text messages provide women with information that is consistent with advice given by health workers in the field. Where women are in contact with health workers, the text messaging service then has the additional benefit of reinforcing advice that women receive from multiple sources.

Messages cover several pregnancy and motherhood related topics, not just nutrition. The list of topics includes:

- Prevention of Mother to Child Transmission of HIV/AIDS
- Antenatal Care
- Family Planning
- Malaria prevention
- Nutrition (for mother and baby)
- Danger Signs
- Individual Birth Plan
- Post-partum Care.

<sup>14</sup> intermittent preventative malaria treatment during pregnancy, sulfadoxine-pyrimethamine (IPTP-SP).

A key feature of the Value Proposition is how timely and relevant information is to the needs of women (and their supporters). This is one area where the partnership with the Tanzania Food and Nutrition Centre (TFNC) adds value to the service, as TFNC is responsible for ensuring that the content is accessible and consistent with national nutrition strategies.

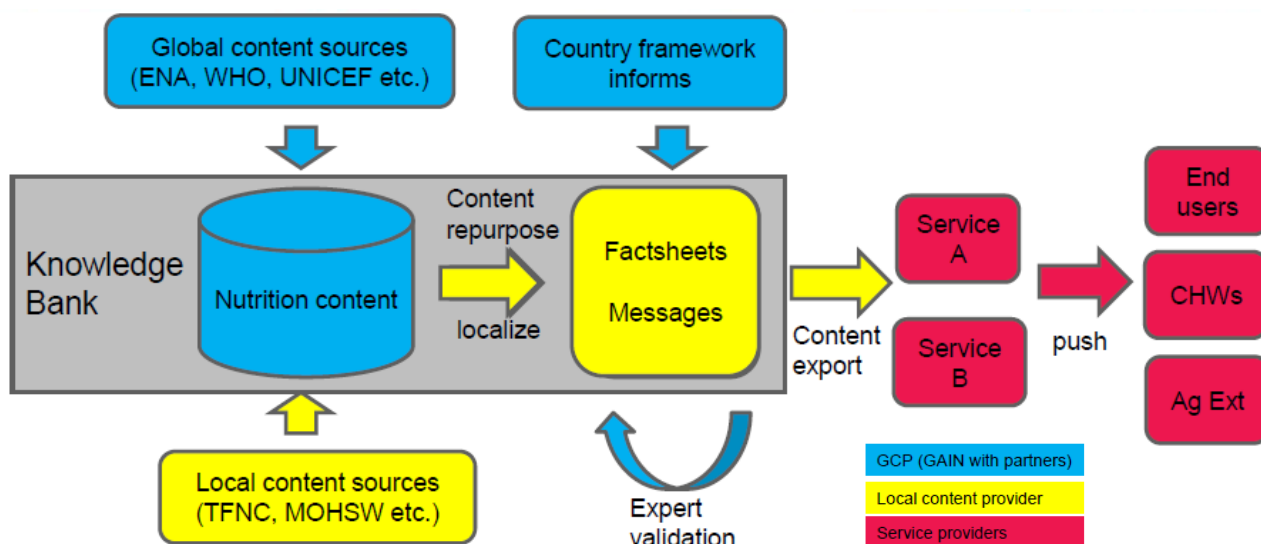
Partnerships with institutions running field level interventions are another key part of the Value Proposition. Not only do these institutions run campaigns, which may have local or even national reach, but they also tend to have a field presence either through their own health workers, or by working in partnership with existing health facilities. This local presence is important in getting people to sign up to the text messaging service, but just as importantly, it provides an opportunity for women to engage in dialogue, so they can better understand and act upon the advice they receive.

All of these are features of the service that was set up by the mHealth Tanzania PPP prior to the mNutrition project i.e. the infrastructure required to distribute the nutrition content was already in place; a positive score (of 3) has, therefore, been given in Table 4 for economy of scope.

### 5.2.2 The content generation process

The content generation process has been led by the Global Content Partnership consortium, comprising CABI, the Global Alliance for Improved Nutrition (GAIN), Oxfam, the International Livestock Research Institute (ILRI), and the British Medical Journal (BMJ). The Global Content Partnership was responsible for identifying relevant content, creating content structures, and specifying content validation and quality control processes. A Local Content Partner was selected in each country to rework content to suit the local context, and to translate as necessary (see Figure 11). GAIN was the organisation that took responsibility as the lead partner in Tanzania.

**Figure 11 Content generation process (GAIN 2014)**



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The Tanzania mHealth PPP brought to the GSMA mNutrition partnerships a pre-existing database of messages targeting pregnant women and new mothers, which had been developed over a number of previous partnerships, each of which had a slightly different thematic focus. The challenge for the local content generation process was, therefore, to merge the two sets of

information – one brought by the Tanzania mHealth PPP and one provided through the mNutrition programme by the Global Content Partnership consortium (CABI, GAIN, ILRI, BMJ, and Oxfam).

In the absence of an ideal local content partner with both technical and nutrition expertise, the global content partnership contracted Every1Mobile (E1M), who did have technical skills ideally suited to the task, even though this is a UK based company with no local presence in Tanzania. E1M then partnered with World Education Inc. (WEI), a US based organisation with offices in Arusha. WEI already had a working relationship with the Centre for Counselling, Nutrition and Health Care (COUNSENUTH), a Tanzanian NGO working in nutrition, which had experience of using mass media in behaviour change communication programmes. After a couple of months, it was found that this arrangement involved too many layers of management, so E1M then contracted COUNSENUTH directly, which is why WEI does not appear in the relationships illustrated in Figure 12.

**Figure 12 Content development process and relationships in Tanzania (Blomberg 2016)**



*Reproduced with permission*

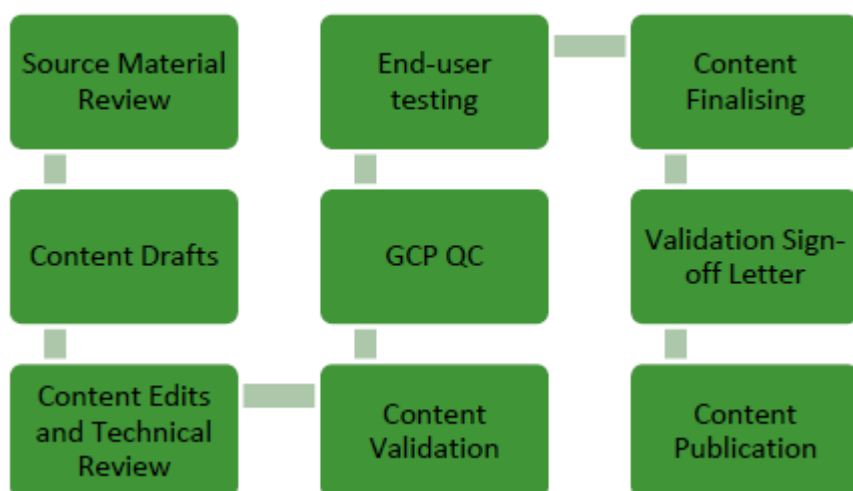
The local content generation process is outlined in the schematic presented in Figure 13. Four batches of content were developed:

1. Pregnancy and post-partum women
2. Newborns, infants, and lactating women
3. Young children, women of reproductive age, and adolescents
4. Food storage, processing, preservation, and hygiene.

A total of 62 factsheets, 990 SMS and 312 voice transcripts were created (Blomberg 2016). TFNC were the government agency responsible for signing off content at the end of the content generation process. TFNC adopted a much more proactive role than just approving content. When the content generation process was changed to facilitate the production of more detailed, localised content, TFNC took the opportunity to increase their involvement in the programme. This level of engagement and awareness of the programme played an important part in ensuring that signing-off procedures went smoothly.

TFNC did not work alone in approving final content, but they shared responsibility with other members of the National Nutrition Social and Behaviour Change Communication Technical Working group (SBCC TWG). The National Nutrition Strategy calls for a Social and Behaviour Change Communication strategy to guide behaviour related nutrition activities. The Technical Working Group reports to the High Level Steering Committee on Nutrition, which is chaired by the Prime Minister's Office (MoHSW 2013). This illustrates the importance to the content generation process of forging alliances with existing structures within the country. TFNC was given financial resources to fund the content validation work, which helped avoid putting undue strain on these existing relationships.

**Figure 13 Local content process (CABI 2017)**



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At the beginning of the programme, it was expected that content delivered by the Global Content Partnership would simply be made available to all partners participating in the mHealth service, and that each participating organisation would use their own resources to adapt the key messages to specifically match their target audience and to suit their own objectives. This was subject to an obligation (or expectation) that nutrition content would be made available free of charge to users. The global content partnership was, therefore, mandated to create higher level, generic content, and little provision was made to create specific, locally relevant messages. However, when the original 'clearing house' vision was abandoned, one of the implications of the partnership with Wazazi Nipendeni was the need for a new stream of work to create specific, locally relevant messages, in local language, that were integrated into the existing Wazazi Nipendeni database of content.

The Global Content Partnership, particularly CABI and GAIN, regarded one of their primary contributions to the mNutrition programme to be in capacity building – working with local partners to help them identify high quality information, to adapt information to local contexts without losing technical accuracy, and to help them devise quality control procedures and processes. However, when the focus of the content generation process shifted from more generic content towards local content, additional work was required to generate information that was directly relevant to specific sub-groups of beneficiaries. GSMA did provide some additional funding for user research to support this additional work.

### **Prelude to Learning**

There is immense value in establishing relationships (even if not necessarily formal partnerships) with thematic structures that exist within the country, especially if they extend to government agencies with responsibilities in the area of intervention. How will these relationships evolve over the next two years?

## **5.2.3 User experience research**

**End user testing.** GeoPoll were contracted to test a small sub-sample of messages – 6 from each of the 4 batches of content. GeoPoll have expertise in conducting mobile phone based surveys in developing countries, so they were able to send the test SMS messages to selected women, followed by a series of evaluation questions, also sent by SMS. The groups were drawn from two different geographical locations of the country, and each consisted of 25 women, who were either pregnant, or had children under 2 years of age. The evaluation questions tested two aspects:

- comprehension – did women understand the principle the message was intended to communicate;
- relevance – this was assessed on stated willingness to comply with the message (using a Likert scale).

Levels of comprehension were found to be high, and willingness to comply was over 90%, so few recommendations to change messages were made.

### **Example of evaluation question (Blomberg 2016)**

**Test message.** *“Dear mother, all tomatoes should be washed with clean water before use to remove dirt, insects, insect eggs and pesticide residue”*

**Comprehension question.** *“Why is it important to wash tomatoes with clean water before use?”*

- 1) *To remove dirt and insects and pesticides; or*
- 2) *To make them taste better;*

**User research.** GAIN contracted ThinkPlace to conduct user focused research using human centred design principles. The research was based on semi-structured individual interviews and user profiling. They then generated a set of four ‘personas’ intended to assist with the design of the



messages. As part of the process, they also created prototype messages with different characteristics, and tested preferences among participants. The personas were divided into two categories:

- Influencers:
  - The caretaker – knowledgeable about childcare, health and nutrition based on what she learned from her elders and from experience of having her own children; respected and consulted widely.
  - The supportive partner – supports his growing family; family is important, keen to contribute to family health, as being a provider makes him feel like a man.
- Women of reproductive age:
  - The complacent idealist – a woman of reproductive age with young children; has control of family matters, illiterate but will cross check information.
  - The trendy adolescent – modern and fashionable young woman; intensive phone users; likes being connected to people.

Shortly after the ThinkPlace research was carried out, frog conducted further user experience research (see below), and came up with an additional three personas:

- The new neighbour - Impressionable youth: first pregnancy and far away from family and traditions.
- The discerning consumer - Independent urbanite: first pregnancy and confident in her beliefs.
- The social shopkeeper - Respected community member: mother of two with newborn.

**User Experience research.** This research, carried out by frog, was based on in-depth interviews with 16 participants drawn from two geographical areas of Tanzania (urban and rural), none of whom were Wazazi Nipendeni users. They explored a range of issues around awareness of the product and branding, and how it might best be marketed, registration and user education, and practical insights into the formatting of messages, such as appropriate vocabulary. Findings from this research are referred to throughout Section 5.

These research activities, funded through the mNutrition programme, helped with two aspects of product development. The Geopoll and Thinkplace activities looked at the messages and how they might fit with different types of consumers (the archetypes). The frog research, on the other hand, took a broader view of how to improve the customer's experience of the service (covering a range of issues mentioned above). While some of the recommendations can clearly be seen in the current product (e.g. leveraging assisted registration through health workers), the Wazazi Nipendeni service was operational long before it received support through the mNutrition project, so it is not clear to what extent the product has been influenced by these research activities.

### ***Prelude to Learning***

It is helpful to have people with user design expertise in the core management team who can be called on at short notice, as they are able to provide helpful insights through brief assignments in a timely manner. Once the GSMA support officially ends, will the Wazazi Nipendeni team undertake UX surveys and continue to refine messages?



Further research should explore how core partners and product development have been influenced by research and business intelligence activities.

#### 5.2.4 Integration with Field Services

The Wazazi Nipendeni text messaging service does not work in isolation, indeed much of the Wazazi Nipendeni campaign materials are designed to encourage women to engage with the formal health sector. For example, Individual Birth Planning brochures are designed to be filled out in discussion with health workers during ANC visits. During the qualitative research, health workers articulated the value of reinforcing health messages delivered through multiple channels. They felt that women would be more likely to believe and trust the information they were providing if it was reinforced through another medium, such as the text messaging service or radio. Women themselves also confirmed that this was likely to be the case. A high score for integration of channels has been given in Table 4 because of the involvement of government health professionals in promoting the service (see Section 5.3.1).

Health workers tend to lack knowledge on nutrition matters, so this reinforcing effect is unlikely to be seen with the nutrition content. In this case, the Wazazi Nipendeni text messaging service is more likely to be working in isolation, given that the effort that health workers can dedicate to educating people on nutrition matters is constrained by time (they tend to have higher priority responsibilities) as well as their own knowledge. This will tend to diminish the potential impact of the nutrition messages. However, the TFNC has yet to officially launch the nutrition messages<sup>15</sup>, and its intention is to collaborate with partners running nutrition programmes in the country, which will provide an opportunity for SMS message content to be used in conjunction with field work. This also highlights the potential for information disseminated by Wazazi Nipendeni to build the capacity of field workers. Although not explicitly identified in Section 5.1, health workers could, therefore, be regarded as a customer segment.

##### *Prelude to Learning*

The text messaging service can achieve greatest impact where it complements field work, and messages reinforce information given by health workers. Research is needed to assess how important this factor is, perhaps by comparing the impact that messages can achieve on their own.

The service has the potential to build the capacity of health workers, especially in nutrition matters, given that health workers themselves can access the additional nutrition content.

#### 5.2.5 Timeliness of Information

The qualitative research confirmed that women have difficulties in accessing health-related information in a timely manner. Primary sources of information include dispensaries, community health workers, and village meetings. Dispensaries are inconvenient because they are often located outside of the community, so it can take time and money to travel to the facility. Women can only speak to a health worker and attend a village meeting when they visit or take place. So, timing of information is clearly a need felt among women, and one that the Wazazi Nipendeni

<sup>15</sup> An official launch is scheduled for August 2017.

service can meet by providing information that is synchronised with a client's stage of pregnancy, or age of child.

Furthermore, in the context of a village meeting women can only get broad, general information. By contrast, the Wazazi Nipendeni service can provide them with information that is directly relevant to each individual client at her stage of pregnancy, or age of child.

An information 'push' type of service generally has the drawbacks that delivery of information cannot easily be synchronised with when users need that information, and that there is no way of ensuring that users will actually read the messages. The qualitative research found that people do indeed suffer from spam, but nevertheless they tend to read messages before they are deleted, which suggests that even though they may not be searching for information, users may well still access the information.

The qualitative research highlighted the role of NGOs in running nutrition programmes within the Iringa district. However, users effectively dismissed these because they were usually short lived. This illustrates the potential value of a text messaging service in that it is independent of a local presence, which is expensive and tends to be temporary. Of course, the continued operation of the Wazazi Nipendeni service is not guaranteed, but as long as it receives sufficient support to function, it can be accessed throughout the country. The extended time period of operation of Wazazi Nipendeni means that it has a better chance of gaining traction than local, temporary interventions.

### ***Prelude to Learning***

Women can only access conventional sources of information occasionally, and information is often generic. Mobile phone based information promises to offer value by being sent regularly, and being tailored to a woman's stage of pregnancy, or the age of a child.

The service has the potential to become integrated into health-seeking behaviour as it has a longevity beyond that offered by many temporary health campaigns.

## **5.2.6 Does Information meet Customer needs?**

Wazazi Nipendeni provides information relevant to pregnant women, young mothers, and children up to 16 weeks post-partum. Content covers a range of topic areas including access to antenatal health care, safe deliveries, breastfeeding, malaria, and HIV. Although the original messages included some content that addressed nutrition, the nutrition content provided by the mNutrition project was a new resource. Nutrition messages have been introduced in 2 rounds:

- In February 2016, 31 nutrition messages were added to the Wazazi Nipendeni service – these messages were selected on the basis that they coincided with the existing scope of the Wazazi Nipendeni messages - that is, covering pregnancy and up to 16 weeks post-partum.
- TFNC (and others) wanted more messages, as their priority was the health of children under 2, so they wanted to include additional topics that would be relevant to children older than 16 weeks (e.g. malaria, exclusive breastfeeding). Therefore in December 2016, a further 128 messages added. A workshop was convened to review the entire pool of messages and to agree what should be added to the Wazazi Nipendeni body of messages. Messages were categorised according to life stages up to 5 years (i.e. children under 5), and by channel (pregnant woman, supporter, newborn, and general information).

Once added to the Wazazi Nipendeni database, a total of 156 nutrition messages made up about 70% of all messages on the system. As before, the pregnancy and maternal health information still covers children up to 16 weeks post-partum, but thereafter, users continue to get nutrition messages for up to 5 years.

The qualitative research explored women's access to nutrition information, and found that overall, knowledge about breastfeeding is generally good in Tanzania, although there remain a few issues of uncertainty, e.g. women are not sure when to start breastfeeding, appropriate frequency and duration of feeding, what to do if they are sick, and health professionals pointed out that most mothers introduced complementary feeding too early (i.e. before the recommended 6 months). While women had some knowledge of good child-feeding practices, they appeared to dismiss this information as not relevant, primarily on the basis that they lack the financial resources required to comply with good practice, e.g. it is not possible for them to eat meat twice a week. This view was consistent with a general misconception that healthy food can only be purchased (as opposed to grown at home). This highlights a need for information on how to prepare nutritious meals using inexpensive food and using food from the households' own agricultural production. Pregnant women were also keen to source information on what types of foods to consume and which to avoid during pregnancy.

The impressive achievements of the Wazazi Nipendeni service described in Section 5.6 suggest that information is well aligned with customer needs, but the score in Table 4 has been moderated (to 3) because the relevance of nutrition messages does not seem to be immediately obvious to women.

Women said that they did get information on food choices during antenatal care visits. However, they pointed out that over the course of the recommended four ANC visits, a large number of technical tests needed to be carried out, leaving little time for in depth discussion of nutrition matters, so the information they got tended to be fairly basic.

The baseline qualitative research, therefore, appears to confirm that there is a need for nutrition information, but given that breastfeeding knowledge is reasonably good, and women's choice of foods is constrained by financial limitations, their top information needs are likely to centre around good foods during pregnancy, and simple, practical recipes. A list of messages produced for Tanzania suggests that content tends to focus on more technical issues such as promoting fortified foods, vitamins, and information on specific foods (Global Content Partnership 2017); further research is required to assess how well specific content matches actual needs.

One consequence of changes in the content development process is that there has been a disconnect between content development and delivery. The original vision did not make any provision for detailed dialogue between those tasked with designing and developing content, and organisations expected to deliver the content. This was because delivery partners were expected to have local content development capability, and it was expected that they would integrate the nutrition content into their own content (this is described in more detail in Section 4.2). In the end, the mHealth Tanzania PPP and its partners have taken responsibility for selecting and scheduling the delivery of messages. Some of the human centred design research described in Section 5.2.3 was commissioned specifically to help bridge the gap between the more generic style of content generated by the GCP, and the locally relevant messages that Wazazi Nipendeni needed to distribute. Furthermore, there was no budget allocated to the distribution of nutrition messages, because it was assumed that this would be met by those partners to the national hub that had a mandate to distribute nutrition content. Further detail on the global and local content generation processes can be found in the "lessons learned" report prepared by the Global Content Partnership (Global Content Partnership 2017).

**Prelude to Learning**

Priority nutrition information needs appear to focus on pregnancy and practical recipes, but it is not clear how well the content matches these needs.

**5.2.7 SMS, Voice Messages and Literacy**

The Wazazi Nipendeni text service is not likely to be highly valued by illiterate sections of the population, which will include a substantial proportion of young women (15% - see Section 5.1), and a higher proportion of elderly women who would be classified as Carers. These Customer Segments were considered in the mNutrition project plan, which expected national partners to record messages in local language and make content available via interactive voice response (IVR) or outbound dialling (OBD) platforms. However, at the beginning of the project, the Wazazi Nipendeni platform did not have this capability, and efforts were made by GSMA to find a complementary partner that could manage audio content.

Not only was the original Wazazi Nipendeni platform not able to handle voice messaging, but IVR messaging was at odds with the donor funded model developed by Wazazi Nipendeni to facilitate the delivery of text messages. IVR is much more expensive than SMS, so attempting to incorporate the costs of an IVR messaging service would have upset the existing agreements with MNOs.

HNI was subsequently commissioned to incorporate the mNutrition content into their 321 service, provided in partnership with Vodacom. HNI was already partnering with GSMA in the mNutrition programme, acting as an mHealth service provider in a number of other countries. In contrast to Wazazi Nipendeni, the 321 service is a 'pull' type of service, whereby users dial a short code and navigate through interactive menus to find the information they are seeking. The system mostly plays audio clips to users, rather than sending SMS text messages. 30 IVR scripts were selected to be integrated into the 321 Health service, and were being recorded at the time of the baseline field visits. The messages to be integrated into the system were chosen carefully to ensure there was no duplication of messages across the two platforms. By designing complementarity between the two services, it was intended to minimise any sense of competition between them, so it will make sense for each service to promote the other without confusing users.

**5.3 Channels**

*"How a company communicates with customer segments. Channels are customer touch points that shape the customer experience, e.g. communication, distribution, sales."* (Table 1).

This section considers the variety of ways in which customers engage with the product in the awareness and registration stages of the customer journey. It then goes on to consider issues associated with the delivery of the service itself – that is, trust and SMS as a delivery channel.

**5.3.1 Acquisition and registration**

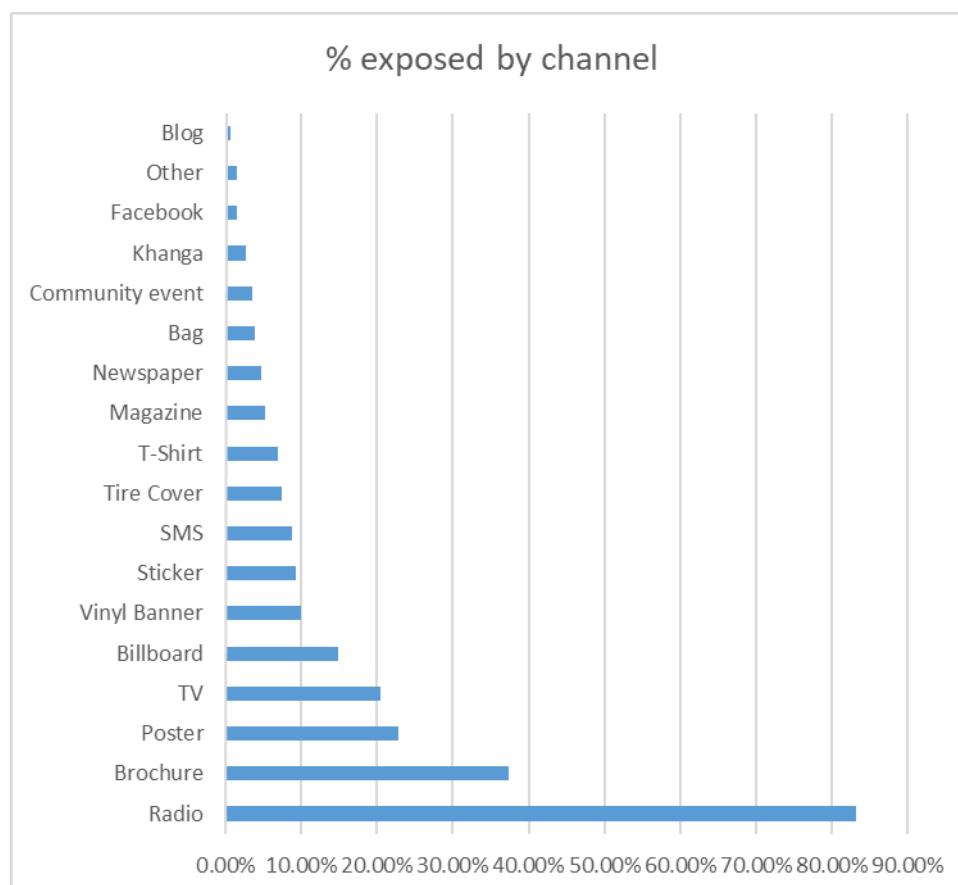
As a multi-media campaign, women were targeted through a comprehensive range of channels:

- Mass media: TV, radio, newspapers and magazines
- Print media: brochures, billboards, vinyl banners

- Other promotional items: stickers, tyre cover, t-shirt, bag, kanga
- Electronic media: SMS service, blog
- Social media: community events, Facebook

Radio was the single channel that achieved greatest reach during phase 1 of the campaign (Figure 14 presents results from a survey carried out in October 2013).

**Figure 14 Women's exposure to campaign materials<sup>16</sup>**



*Authors own*

Missing from the list above is field-based partners. During the phase 1 campaign, printed materials were distributed to a range of health facilities including hospitals, health centres, and dispensaries, where women come into contact with health professionals. These professionals can explain the service, answer queries, and effectively endorse the content. Moreover, trained health professionals can help women register on the system. In the absence of a comprehensive multimedia campaign, awareness of the service will increasingly depend on the work of implementing partners and health professionals so in Table 4, a neutral score has been given for customers seeing channels. There are 3 ways of registering for the Wazazi Nipendeni text messaging service:

- Self-registration – instructions were given in the multimedia campaign. People dial the short code and then are guided through a small number of profiling questions (category of user, and stage of pregnancy / age of child).
- Assisted by health facility worker – women can be signed up when they come for ANC visits etc.

<sup>16</sup> <http://www.thehealthcompass.org/sbcc-spotlights/wazazi-nipendeni-love-me-parents>

- Assisted by community health workers – community workers can sign women up when they visit them in their homes, or other local venue.

Assisted registration, either in communities, or in facilities, is facilitated by representatives of ‘on the ground’ partners who have been trained, e.g. EGPAF. Partners will typically have invested time and effort in developing programme materials in collaboration with the PPP, for which PPP will usually have provided some training, so training on text service registration processes can be included at marginal additional effort. In this scenario, the mHealth Tanzania PPP only has to pay travel expenses for trainers – partners are sufficiently keen for clients to be registered with Wazazi Nipendeni that they are willing to pay for the additional training. Frog research based on in-depth interviews (described in Section 5.2.3) found that users prefer assisted registration.

Not only is assisted registration more convenient for users, but it offers a range of additional benefits. Although mass media channels can be effective in raising awareness of the Wazazi Nipendeni campaign, clients may lack a sufficiently detailed understanding of the product to convince them to register for themselves; personal contact can help get them signed up. Personal contact can address common concerns that users may have, such as costs, how to register, how to unsubscribe etc. The most influential individuals to assist with registration are likely to be known and trusted individuals, and those that users have regular contact with, such as community health workers, community and religious leaders. The effectiveness of assisted registration and the field presence offered by implementing partners are reflected in positive scores in Table 4 for effectiveness of channels and reach into customers. However, scores for churn rates are low (-4), reflecting the constant need to acquire new users as women become pregnant, and the cost of acquisition, especially through assisted registration, is high.

TFNC believes that there is a qualitative difference in the user experience between users who were assisted with registration and those who used the self-registration process. They believe that people who engage with a health professional in order to register on the system are more committed to the service, and will have a positive bias to comply with messaging. They also suspect that contact with a health professional will give them a better understanding of how the service works, so they are less likely to become frustrated with the service, and are more likely to appreciate how they can benefit from the service. Further research is required to test this assertion. The emphasis on working with implementing partners generates synergies (scored 3 in Table 4), and networking effects, also scored 3 in Table 4.

### 5.3.2 Perceptions of trust

The preferred source of health information identified by the qualitative research was health workers based in the local health facility, and the second most trusted source of information was interpersonal relationships, mostly with women who had children already, e.g. neighbours, their own mother, mother in law, other female relatives, and elderly women within the community. In their user research, frog found that the government was widely, although not exclusively, regarded as a trustworthy source of information (Frog 2016). This was subsequently corroborated by a number of findings from the qualitative research. For example, facility-based health workers are the most trusted source of information, over health workers from NGO facilities (e.g. mission hospitals), because information is perceived as being approved by the government. It was further supported by findings from the baseline quantitative survey, which found that government health workers were regarded as the most trustworthy source of health information (98% would trust) (Gilligan et al., 2017). Information received over radio was also widely regarded as trustworthy, because radios operate under the mandate of the government. This suggests that there will be value in branding health messages with a government endorsement of some kind.



### 5.3.3 SMS as an appropriate medium

The qualitative research found evidence that communities are already familiar with the use of SMS text messages as a means of disseminating information on health and nutrition topics. Some women had received messages about a specific topic (e.g. messages sent by the government on birth registrations and certificates). Others had received promotional messages encouraging them to subscribe to health information services.

Information is to be made available to users through two services – Wazazi Nipendeni and Vodafone’s 321 service (not yet operational at the time of writing). It has been pointed out in Section 5.2 that by providing IVR recordings, the 321 service will cater particularly for those customers that struggle with written messages. On the other hand, the qualitative research identified a number of features of SMS messaging used by the Wazazi Nipendeni text messaging service that fits well with women’s lifestyles:

- Text messages can be read repeatedly – audio messages may be heard incorrectly
- As messages remain on the phone, they can be shared with friends and colleagues at any time
- Text messages are private – they remain on the phone, which tends to be regarded as a personal device; audio messages can be overheard by others.

Although internet based rich interaction services will eventually displace SMS as the best way of disseminating information (see 3.1), this is not likely to be the case in the foreseeable future, so a positive score (of 3) has been given in Table 4 for channels becoming obsolete.

In addition to literacy constraints associated with text messaging, SMS only facilitates one-way communication, yet the qualitative research clearly shows that channels that encourage active interaction and communication are preferred. For example, mothers liked educational group seminars and counselling by health workers as they provided the opportunity to ask questions. Note that personal interaction is discussed in Section 5.3.1, but this is in the context of engaging people to encourage them to sign up for the service. It is also asserted that assisted registration may result in improved compliance, which is consistent with findings of the qualitative research: that an ability to interact will lead to improved intervention outcomes, and is part of good behaviour change communication practice.

#### ***Prelude to Learning***

The profiling procedure is simple, meaning that self-registration is viable. How does the balance of self-registration and assisted registration change over time?

Assisted registration is more effective than self-registration. But by how much? Assisted registration is a much more expensive means of customer acquisition, but it may be cost-effective if it results in substantially higher client compliance, and improved outcomes.

Known and trusted individuals are the best people to help with assisted registration. Can this be tested?

Government health information is widely regarded as trustworthy, so messages should be branded with government endorsement. How does this affect the product as the government increases its branding of it?



## 5.4 Customer Relationships

*“The types of relationships a company establishes with specific customer segments. Relationships may be driven by various motivations, e.g. customer acquisition, customer retention, boosting sales.” (Table 1).*

Issues of trust and branding impact on all aspects of the customer relationship from the services user’s point of view. It is also worth considering those institutions that pay for the services (through grants or in kind) as customers.

### 5.4.1 Purpose of Customer Relationship

Relationships with customers are mediated through the Channels described in Section 5.3. The aims of the Customer Relationship that WN creates with users can be considered to be threefold:

- Acquisition – getting people to register for the service. For those who self-register, the relationship is completely automated, experienced initially through whatever media convinced the user to register, and then through their experience with the automated registration process, and finally through the content received in the messages. Those who enjoy assisted registration will have quite a different relationship with the service, shaped mostly by their personal experience of interacting with the intermediary or agent who convinced them to sign up, and who performed the registration process for them. Furthermore, their ongoing experience of the service will not be determined only by the content of messages, but also by whatever support and interaction they may continue to benefit from, through the field agency.
- Retention – from the MNO’s point of view, the service offers a mechanism for increasing customer loyalty over the period of relevance of the content. Given that the service is free of charge, there is no need for any billing or payment processes, both of which can be difficult to engineer in a customer friendly way, and both of which can cause customers to stumble and drop out of the service. Similarly, once a user’s pregnancy or maternal status has been captured by the registration process, there is no need for the system to gather further information from users, and it is these registration process that can confuse customers and deter them from updating information, if not drop out of the service altogether. Perhaps the most important factor in ensuring customers keep using the system is the perceived relevance and value of the content itself (which is a key part of the Value Proposition offered by the product, and is discussed in Section 5.2).
- Compliance – from a health outcomes point of view, the service will achieve greatest impact if it can successfully persuade people to constructively change their behaviours. This also depends largely on the perceived relevance and value of the content, but more than that, it depends on the motivation of customers to comply with the messages they receive. This, in turn, depends on a complex set of factors, one of which is the perceived trustworthiness of the content, which is closely linked to branding, discussed further in Section 5.4.3.

### 5.4.2 Trust

Even though the Wazazi Nipendeni service is free to users, the qualitative research found that some people are reluctant to subscribe to any mobile phone based survey because they are afraid it will take their credit. This may reflect a lack of trust in mobile services, which may not fully disclose or explain charging structures, or it may reflect a general lack of awareness of how mobile services charge for services. Either way, it has been highlighted as a potential barrier to signing up for Wazazi Nipendeni, which is likely to affect lower status socio-economic groups

disproportionately, i.e. those who are illiterate and have low levels of technology and financial literacy. It will, therefore, be important for Wazazi Nipendeni to build sufficient levels of trust and awareness into relationships to overcome this potential barrier.

A second aspect of trust relates to the information itself. This is important in building demand for the service, and in enhancing compliance with messages. The finding that the government is regarded as a trustworthy source of health information (see Section 5.3.2) suggests that emphasising the government stake in the service (rather than that of MNOs) and branding it as a government service may be one way of building trust in the Wazazi Nipendeni service; this is discussed further in Section 5.4.3.

In Table 4, a neutral score has been given for customer relationships on the basis that the majority of users have an impersonal experience, through self-registration, yet levels of trust in the information are likely to be high, given the positive attitudes towards government sourced health information.

### **5.4.3 Branding**

Wazazi Nipendeni has a strong brand, which is quite distinct from the MNOs that support the service, and it is asserted that users view it as a Ministry service, so brand strength has been scored highly (4) in Table 4. People view Wazazi Nipendeni messages as coming from the government, as it is the government that has pushed it through the media. Therefore, people do not necessarily realise that messages are coming through the MNO, nor do they appreciate that the MNOs are paying for the messages. The mHealth Tanzania PPP are not concerned that MNOs might assert greater ownership of the service, because the government has recently increased its commitment to the service, and is interested in increasing its ownership of the service. Originally Wazazi Nipendeni was branded a CDC action, but gradually they are diminishing the CDC logo and enlarging the Ministry logo. The change in branding reflects an aspiration within the mHealth Tanzania PPP that the Ministry will adopt the service fully as part of its core activities.

It is somewhat surprising that the level of commitment by MNOs to the service is not reflected in the branding of the service, indeed, MNO identities are absent from Wazazi Nipendeni promotional materials. Neither do MNOs appear to refer to Wazazi Nipendeni in their promotional materials. This is due, at least partly, to the fact that support for Wazazi Nipendeni was secured mostly through the CSR departments of the MNOs, which tend to have minimal marketing budgets. This is discussed further in Section 5.6.

Another aspect of branding is the image that the service fosters among customers. In their early customer research, frog made an interesting observation that 'soft' branding was more likely to foster a positive image (and greater compliance) than direct marketing. Soft branding was described as building an emotional connection with customers, whereas direct marketing is an approach designed to sell specific products. They embellished this further by suggesting that messages should be tailored to emphasise health, and they should be family focused. This approach was then reinforced still further in the new creative design used for branding phase 2 of the campaign, launched in July 2015 – see Figure 15.

**Figure 15 An example of Phase 2 branding (Johns Hopkins Center for Communication Programs)**



*Reproduced with permission*

The importance of the ‘tone’ of messages has proven to be a particularly salient observation, given the experience of the content creation process. It was intended that the Global Content Team would provide the high-level topics and the clinically accurate information, based on published evidence. After the original clearing house concept was abandoned, the intention was that the local content partners would then convert this high-level content into specific messages that would be relevant and, more importantly, accessible and easily understood by users. Content localisation called for a delicate balance between clinical precision, or accuracy on the one hand, and common understanding and colloquialisms on the other. This created a tension between the bodies responsible for approving local messages, and those responsible for making the messages accessible to the majority populations, most of whom had poor levels of education, and probably had little understanding of nutrition or medical vocabulary. Should messages be clinical and factually accurate, or should they be friendly and worded in imprecise terms used in everyday language? Further research is required to explore the pros and cons of each approach and which, if either, proves to be a more effective way of communication.

#### 5.4.4 Donors

Given that most of the funding for the mHealth Tanzania PPP comes from CDC, it can be argued that the most important relationship is that with CDC. This is now mediated through Cardno Emerging Markets, the company commissioned to manage PPPs on behalf of CDC. This begs the question, “what do donors expect from Wazazi Nipendeni?” as providing evidence that the service is delivering the benefits expected will be an important part of keeping donors on board. Although commercial viability was a priority for DFID in their original concept for the mNutrition programme (see Section 4.2), it is not clear that this is a similar priority for other donors and organisations that have supported the service over the years.

Each of the four MNOs providing zero-rated SMS messages can also be regarded as donors to the service, as they give messages to the service free of charge. Relationships with MNOs are channelled through their CSR departments, and through the charitable foundation in the case of

Vodacom. It appears that these departments are not particularly demanding in terms of their relationship with the mHealth Tanzania PPP, and are happy to continue contributing by covering the cost of sending messages. In this respect, from the perspective of the mHealth Tanzania PPP, the main purpose of this relationship is the retention of the MNOs as contributors to the service.

### **Prelude to Learning**

Wazazi Nipendeni is regarded as a government service, which is a positive thing, given that the government is regarded as a trustworthy source of information on health. How does this change over time with changes in branding?

User research suggests messages should be friendly, but approval bodies insisted on factual accuracy of messages. Further research is needed to explore which approach is more appropriate.

Donors may have different priorities and expectations of what Wazazi Nipendeni should deliver, which, in turn, may be at odds with priorities of core partners. Further research is needed to identify these expectations.

## **5.5 Revenue Streams**

*“The cash generated from each Customer Segment. Revenue streams will depend on what customers are willing to pay. Revenue streams can be either one-off payments, or recurring revenues. Each revenue stream may have different pricing mechanisms.” (Table 1).*

Wazazi Nipendeni is free of charge to users, so there is no direct revenue stream. It was originally envisaged that information would be made available using a freemium model, which would enable the service to cover costs of the nutrition content delivery. However, late in 2016 the mHealth Tanzania PPP and the Tanzania Food and Nutrition Centre (TFNC) held intense negotiations over whether or not Wazazi Nipendeni would be permitted to charge for these information services. In the end, the government insisted that health information should be made available to citizens free of charge.

The mNutrition project design was based on the assumption that people would pay for information in the same way that they do for agricultural information, and that this would provide opportunities for organisations to develop commercially sustainable business models. However, this has not been the case. It is not clear that there is anything inherently different about the nature of health information, in as much as consumers find real value in the information. One could argue that, at least where farmers grow for markets, the outcome of behaviour change can be measured in financial terms, e.g. increased yields, better prices. This is unlikely to be the case for nutrition information, where the outcomes, such as healthier children, cannot readily be enumerated in financial terms, certainly not at the household level. On this basis, a financial case can be made for farmers to invest in information that will increase their financial returns, but no equivalent case can be made for paying for nutrition information. However, it is political pressure that is the main determinant - governments (across many African countries) have insisted that health related information should be made available for free. Their justification is that national policies state that health services should be made available for free at the point of delivery. However, thinking may well be changing.

There is a long history of publicly funded health care in Tanzania. For-profit health providers were banned in 1977, but this policy started to be relaxed in the 1990s, since when private providers

(both for-profit and not for profit) have played an increasing role (Kolstad & Lindkvist, 2013), and now account for 29% of total health expenditure (Health Policy Project 2016). The health system is highly dependent on foreign donors, who provide almost one half of the total health expenditure (Health Policy Project 2016). However, opportunities for private sector engagements seem set to increase, as the current health sector strategy calls for innovative public private partnerships in health care financing (MoHSW 2015).

The mHealth Tanzania PPP is funded primarily through CDC, although in-kind contributions are made by MNOs through the zero-rating of SMS messages sent out (and USSD sessions for assisted registration). The Ministry of Health is also providing financial support for the new platform (see Section 5.7). Note that mNutrition funding through GSMA has supported product development through content development, user research, and business intelligence services and has not been used to meet operational expenditures.

A description of how the text messaging service was conceived, as part of a multimedia campaign developed in coordination with the Tanzania Capacity and Communication Project, is given in Section 3.2. Since the launch of the service, content has been developed incrementally and women have been reached through targeted campaigns run by partners, and a fuller description of partnerships is given in Section 5.9. A key feature of the service is that it has also been made available to institutions running behaviour change interventions within Tanzania free of charge, so no direct revenue is generated from partner organisations either. Having said that, these field partners make modest contributions to the mHealth Tanzania PPP typically to cover costs associated with training in the use of the Wazazi Nipendeni text messaging service.

The result is that the service is vulnerable to any withdrawal of funding from CDC, and to a termination of the zero rating of text messages by the MNOs. Both Wazazi Nipendeni and GSMA remain keen to find a commercially sustainable model, and have taken steps to address this vulnerability. GSMA convened a workshop of mNutrition partners in February 2017 specifically to explore business models and sources of revenue.

At the workshop, TFNC was introduced to sustainable revenue generation ideas, and they intended to convene an internal workshop to discuss these ideas. One such idea was to explore ways of working with fast moving consumer goods companies (FMCG). In Ghana, Audrey Pack are supporting the mHealth system, on the basis that women will go on to buy the same brand of products that is in the original pack distributed free by Audrey Pack. However, the TFNC focus seems to be on registering women on the system rather than generating revenue to pay for the platform (and mHealth TZ PPP) and messages. For example, in one model of working with the private sector, the company would appoint field agents to go into the field and work with local health facilities to engage with target women; they could then give them sample packs of products, and register them on Wazazi Nipendeni. In this model, the MoH has leverage over the companies by offering them access to health facilities, and through them to their target market (pregnant women and new mothers). These examples illustrate how TFNC are considering innovative approaches to engaging with the private sector, and innovative sources of revenue. One red line is that TFNC would not permit the promotion of food products. However, it is likely to take time for ideas on business models to gain traction and approval within government departments, including those departments that are key partners in the Wazazi Nipendeni model.

In the assessment of the business model presented in Table 4, margins are given a score of 0 because this is a not-for profit model. A high reliance on CDC for funding is reflected in a negative score (of -4) for diversified revenue streams in Table 4, and the inability to charge users means a strongly negative score (of -4) has also been given for charging what users are willing to pay.



**Prelude to Learning**

There is political pressure for the service to be made available for free in line with government policy that health services should be free. Government departments may yet consider raising revenue from third parties, e.g. FMCG companies.

## 5.6 Indirect Benefits

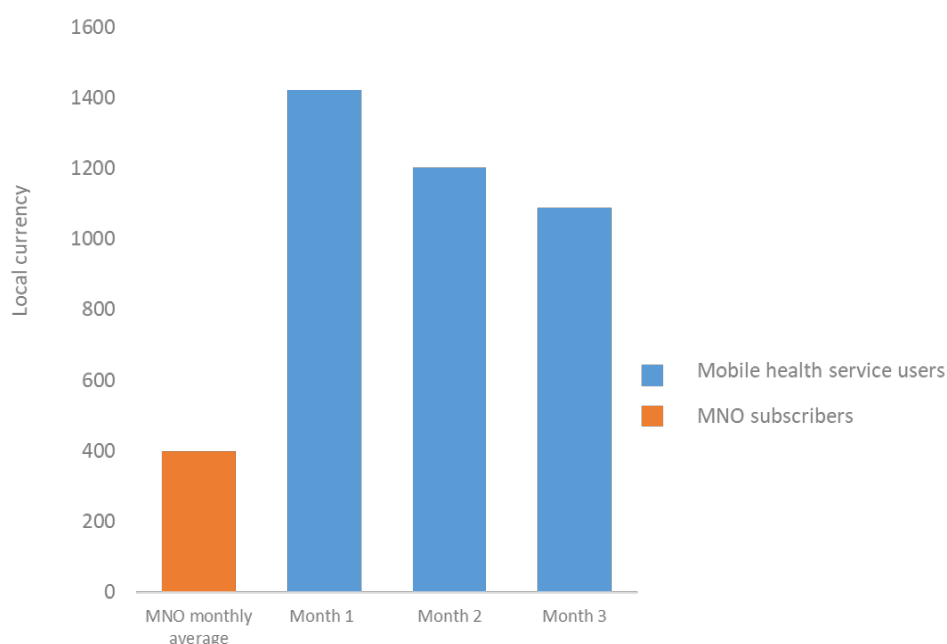
*“Ways in which the service can benefit the company other than by direct revenue generation.”*  
(Table 1).

The qualitative research found that most people use multiple SIMs, swapping them into their phone depending on network coverage, which offers the cheapest tariff, e.g. time of day, off-net tariffs, and bundle features. Value added services (VAS) are recognised as one means of differentiating mobile operators, and of increasing customer loyalty through reduced churn and increased ARPU.

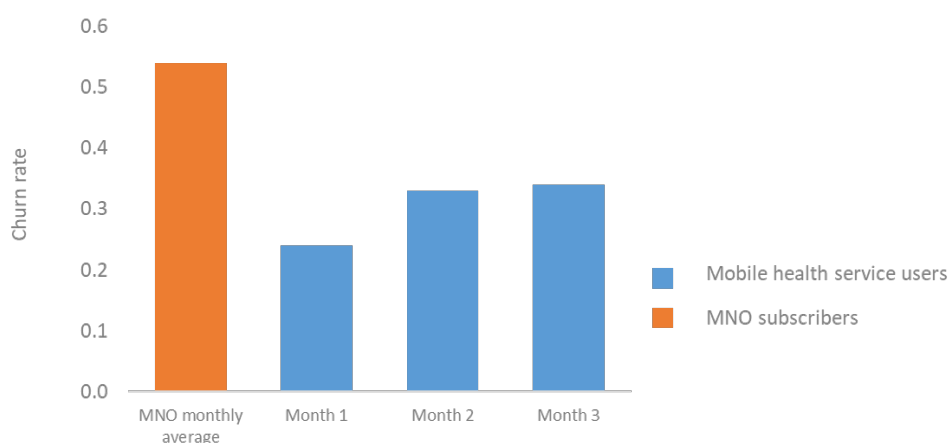
Even though the mHealth Tanzania PPP deals mostly with CSR departments within MNOs (but also marketing), it is seen as a commercial offering in that it increases ARPU and reduces churn. Over and above the effect that VAS have on loyalty, some of the messages distributed by the platform encourage women to communicate with their friends and family, for example, all of which encourages them to make more calls. The original Wazazi Nipendeni content offered the potential of holding customers on the network for up to 12 months (8 months of pregnancy and 4 months post-partum), but incorporating nutrition content covering children up to the age of 5 years now potentially extends the period of relevance to over 5 years.

It remains to be seen whether signing up for a VAS (and Wazazi Nipendeni in particular) will have an influence on which SIM people keep in their phone, but it would seem likely that network coverage and costs will continue to dominate this decision. Nevertheless, the Wazazi Nipendeni VAS is regarded by MNOs as good value when compared with the cost of getting a customer back on to a network after they have left – mostly marketing costs, but also agents and registration<sup>17</sup>. The GSMA are currently looking into indirect benefits, and the Business Intelligence Unit are negotiating with MNOs to gain access to the kind of data needed to conduct this analysis. This is commercially sensitive information, and the GSMA are best placed to conduct these negotiations, so the Independent Study team has been advised to wait to see what data may become available for sharing. To illustrate the potential impact of mHealth VAS on ARPU, GSMA have shared findings from a preliminary analysis of data from another mHealth project in an unnamed country. Figure 16 shows that ARPU among mHealth services users was roughly three times higher than the monthly average for mobile subscribers, and Figure 17 shows that churn rates among mHealth service users was almost half that of other mobile subscribers.

<sup>17</sup> this was \$15/person years ago when Janita was at Tigo.

**Figure 16 Comparison between the ARPU of mobile health service users and monthly average ARPU for mobile network subscribers (GSMA)**

Authors own

**Figure 17 Comparison of churn off network between mobile health service users and other mobile network subscribers (GSMA)**

Authors own

The qualitative research also found that dual SIM phones were not very common, and that people were afraid of losing the other SIM card that was not in the phone. High transactional costs for swapping SIMs increases the potential to persuade people to keep a single SIM in their phone. In this respect, a highly valued service may well be able to leverage increased customer loyalty.

It was reported that under the original system, users had the ability to register more than one phone number, meaning that they should have been able to benefit from the Wazazi Nipendeni service even if they continue to swap SIMs. However, now that the service has migrated to the new mHealth platform, the user's phone number is their unique identification. This eliminates the possibility of accessing the service using multiple SIMs, and effectively ties the users into their current operator. This may not be the case for long, though, because number portability (the ability to change operator but keep the same phone number) is in the process of being introduced in



Tanzania; TCRA have stated that number portability will come into effect from March 2017<sup>18</sup>. Even so, it is likely to be a long time before citizens become aware of their rights, and even longer until they gain sufficient confidence to exercise this option freely. For example, even 10 years after number portability was introduced in South Africa, only 2.5% of the subscriber base port their number in a year<sup>19</sup> (ICASA 2017). Rates in other sub-Saharan countries are lower e.g. rates in Nigeria are negligible nearly four years after the introduction of number portability. All of this means that the Wazazi Nipendeni VAS does indeed have the potential to keep customers on a network (reducing churn).

Despite their considerable support for Wazazi Nipendeni in the form of zero rated SMS messages, it is not clear that any of the MNOs has actively promoted the Wazazi Nipendeni service. Within Airtel, for example, responsibility for Wazazi Nipendeni rests with the CSR department but even they are not focused on the service. When the CSR department presents their projects at public events, no mention is made of Wazazi Nipendeni. This may be because it has no budget line in CSR, and neither does it take up any time – it's just there. Other Airtel CSR projects include, for example, Opportunity for Youth programme (Airtel Fursa), which takes a lot of time to select beneficiaries, and then provides them with financial assistance, e.g. to buy new tools. Zero-rating SMS messages is an opportunity cost rather than a direct cost, so it seems to be a hidden cost, in much the same way as the government mandates MNOs to zero-rate emergency calls to the police.

Why do MNOs supporting Wazazi Nipendeni not promote it? Most MNOs publicise within their advertising and promotional materials any VAS offered as part of any bundle for the very reason discussed above, that these services can increase loyalty. There would seem to be further benefit to be gained in terms of image of the brand, especially if associated with a public good such as child health. Furthermore, the government nutrition services would surely welcome any additional investment in profile for the service, as this would complement government investment in media and behaviour change campaigns. It may be partly historical, as the MNOs have gradually increased their commitment to the service over time. Initially, the mHealth Tanzania PPP bought messages from MNOs in bulk purchases, but then MNOs offered discounted rates and now they have moved to zero rating. In principle, there is potential for tension between promoting Wazazi Nipendeni and the cost to MNOs of sending messages. Getting more people registered would increase the opportunity cost that the MNO would need to bear in terms of zero-rated messages. In practice, this does not appear to be a problem, given that the cost of zero-rating does not seem to be quantified as a real cost. MNOs could send a mass SMS to all their customers encouraging them to sign up, but this has not been done.

There appears to be scope for MNOs to capitalise further on their existing support for Wazazi Nipendeni, and again it appears that GSMA are addressing this opportunity. For example, Airtel attended the recent GSMA workshop on sustainability, where they talked about monetising the Wazazi Nipendeni offering. It was at this workshop that Airtel better understood the contribution of the mHealth product, and how it can contribute to the bottom line, so this has inspired the idea of some analysis into the effect of Wazazi Nipendeni on aspects of customer stickiness (churn, loyalty etc.), and to discuss possibilities with the CSR department.

From the government's point of view, the Wazazi Nipendeni text messaging service offers a means of increasing the effectiveness of their work on improving nutrition throughout the country. Previous research into the Safe Motherhood campaign (i.e. the comprehensive behaviour change

<sup>18</sup> [https://www.tcra.go.tz/images/documents/ict/MNP-FAQs\\_English.pdf](https://www.tcra.go.tz/images/documents/ict/MNP-FAQs_English.pdf)

<sup>19</sup> Annualised porting rate is taken as the total cumulative ports, divided by the number of years since the service was launched.

communication programme that includes the text messaging service) came up with some impressive findings:

- **“Number of ANC visits:** Campaign exposure was a statistically significant factor for ANC visits, with greater exposure associated with more ANC visits, controlling for all demographic variables ( $\beta=0.07$ ,  $t=2.64$ ,  $p<0.01$ ).
- **HIV testing:** Greater exposure to the campaign increased the odds of HIV testing by 18 percent, controlling for all demographic variables (Chi-square (1)=5.94,  $p=0.02$ ).
- **Mosquito net use:** For each increase in message source to which a woman was exposed, there were about 61 percent greater odds the woman slept under a mosquito net the previous night, even controlling for all other demographic variables ( $p<0.001$ ).
- **SP uptake:** Women exposed to more messages had about a 23 percent greater chance of having received two or more doses of SP, controlling for all other demographic variables ( $p<0.001$ ).
- **Individual birth planning:** The more sources from which women reported hearing the Wazazi Nipendeni message, the more they prepared for the birth of their child, controlling for all demographic variables ( $\beta=0.06$ ,  $t=2.55$ ,  $p=0.01$ ).”

(Field-Nguer et al., 2014)

This provides evidence that the service can influence behaviour change, so even though the impact of the nutrition messaging has yet to be established, a positive score (of 3) has been given in Table 4.

Up until the mNutrition project, the Wazazi Nipendeni text messaging service had been used to disseminate information specifically targeted at pregnant women and neonatal health care. Although the nutrition content developed is clearly linked to this demographic, the project has demonstrated how the mobile platform can be used to disseminate information on different, if related, topics. It remains to be seen whether the government will identify further opportunities for exploiting the potential of the platform to disseminate further bodies of information.

### **Prelude to Learning**

There is scope for MNOs to monetise their existing contributions to Wazazi Nipendeni. Airtel have taken ideas from the Kampala workshop and are discussing them internally. It will be interesting to see what develops.

## **5.7 Key Resources**

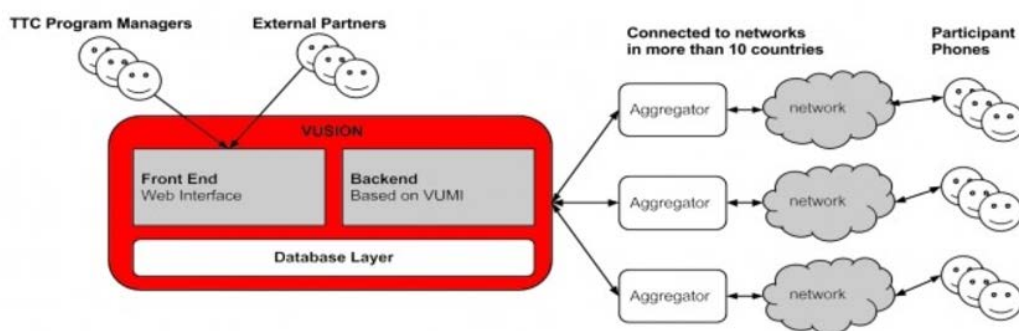
*“Those assets required to make the business model work. Resources that allow an enterprise to create and offer the value proposition, to reach markets, to maintain relationships, and to generate revenues. They can be physical, financial, intellectual, or human.” (Table 1).*

Key Resources are defined as those assets required to create and offer the Value Proposition. The primary assets employed by the mHealth Tanzania PPP in delivering the text messaging service are the content database and the applications platform that sends scheduled messages. The content development process is detailed in Section 5.2.2, which describes how the current content comprises the pre-existing database brought by the mHealth Tanzania PPP, and additional content generated through the mNutrition programme. The mNutrition product was distinct from the Wazazi Nipendeni service, but the target group for the nutrition content was similar to that for Wazazi Nipendeni, so it was decided to use the Wazazi Nipendeni platform rather than create a new text

messaging service. This nutrition content is regarded as a public good, having been paid for by DFID, so CABI will make it available under open access through the Knowledgebase they are developing. There is no exclusivity period for Wazazi Nipendeni to exploit the data so, in principle, others could also use this content at the same time.

The text messaging service originally ran on a platform developed by Text to Change Mobile (TTCM) in partnership with the Praekelt foundation. The 'Vusion' platform was designed to deliver high volumes of messages at scale through direct connections to MNO SMS gateways, or aggregators (see Figure 18). In Tanzania, they partner with a local aggregator who has connections to the associated MNOs. It is interesting to note that TTCM have also made Vusion an open source project, so it is freely available for others to use and modify.

**Figure 18 Vusion platform schematic<sup>20</sup>**



*Reproduced with permission*

Wazazi Nipendeni has since migrated to a new platform, created for the Ministry of Health by a local software developer (Rasello). The service was migrated to the new platform in October 2016, and benefits from improved reliability as well as monitoring and reporting facilities. It is described in more detail in Section 5.9.5.

The text messaging service is not intended to operate in isolation, rather it is expected to serve as part of a multi-media campaign, so these interventions are a key resource required to deliver the full potential of the Value Proposition. Various campaigns and partners that have been involved in the development of the text messaging service, and the content database, are detailed in Section 5.9. The key 'resource' in convening these partnerships has been, and will continue to be, the partnership with the TFNC and their linkages into national nutrition policymakers. The model that has been articulated to exploit the text messaging service in the future is based on forging alliances with health and nutrition interventions launching in the country. These may typically have a duration of around five years. Although existing Wazazi Nipendeni users are currently receiving the updated content, including the nutrition messages, the TFNC has yet to officially launch the nutrition content. It is expected that this will include a concerted effort to network with organisations involved in nutrition interventions with a view to promoting the text messaging facility that is available through Wazazi Nipendeni, and to enter into the next phase of partnerships with field level agencies.

A further resource that the TFNC brings to the partnership is their status as moderator of health and nutrition content, and their technical expertise in this area. Even if TFNC were not a partner in the Wazazi Nipendeni service, the mNutrition project would have needed to seek approval from a government body for the content generated by the project, but the content localisation and

<sup>20</sup> <https://ttcmobile.com/launch-of-the-worlds-largest-interactive-text-messaging-platform/>

approval process appears to have gone particularly smoothly as a result of having TFNC on board. They also provided access to an established expert group through the National Nutrition Social and Behaviour Change Communication Technical Working group:

*“TFNC (both the head of the nutrition education section and a mNutrition focal person) provided support during latter stages of content creation including the content quality assurance processes, while also facilitated the validation of content through the national technical working group on social behaviour change communication for nutrition” (Blomberg 2016).*

Given the partnership model that Wazazi Nipendeni is based on, a further asset that the model depends on is the networking skills of the personnel within the core partners – that is both the mHealth Tanzania PPP and the TFNC. The Value Proposition of the service centres around reaching women, and delivering timely and relevant information. The quality of the content has effectively been proven by what the service has already achieved (see TCCP 2014), but continuing to find an ongoing pipeline of programmes to reach women constitutes an ongoing challenge. It is programmes that will bring funding for campaigns that the Wazazi Nipendeni text messaging service can be part of. The role of the TFNC in the partnership would seem to be most important in this regard, as they are well integrated into nutrition strategy at the highest level within the country.

The original Vusion platform was open source, and there are multiple behaviour change communication projects in Tanzania (see Figure 19), so a negative score (of -2) has been given in Table 4 for the ability of competitors to replicate the service. This score has been moderated by the role that TFNC plays as a core partner, and replication will become less likely as the service migrates to the new platform, and as the government assumes greater ownership of the service.

While the roles played by government agencies, notably TFNC, and implementing partners are key features of the partnership, the reliance on these can also be regarded as representing a vulnerability, so items in Table 4 for threats to resources and quality of resources have been scored negatively.

### **Prelude to Learning**

TFNC is well linked into national nutrition strategies, but has yet to officially launch the Wazazi Nipendeni nutrition messages; it remains to be seen how many nutrition focused partners will come on board (in addition to the existing maternal and child health focused partners).

## **5.8 Key Activities**

*“Things a company must do to makes its business model work. Activities required to create and offer the value proposition, to reach markets, to maintain relationships, and to generate revenues.” (Table 1).*

In order to make the business model work, perhaps the most fundamental activity that needs to be undertaken is networking. Without successfully getting interventions to adopt the Wazazi Nipendeni text messaging service as part of their programme activities, the service would be starved of the oxygen of publicity and promotion, which is an important part of driving up numbers of users registering on the system. Without successfully soliciting the support of MNOs, the cost of the system would be considerably higher.

Successful networking probably depends mostly on having good contacts, which both TFNC and the mHealth Tanzania PPP clearly do. It also depends on the degree of influence that partners have, and this appears to be a particular strength of the TFNC, as they are well integrated into national nutrition strategies. Personal skills are also important, and findings from stakeholder interviews suggest that this is probably more so in the cultural context of Tanzania than in other countries, although this tends to be a feature of business across Africa<sup>21</sup>. The skills within the mHealth Tanzania PPP and the contacts within TFNC appear to be unique, making these activities difficult to copy, so a positive score (of 4) has been given in Table 4.

A key part of negotiating with potential partners for Wazazi Nipendeni will be evidence of the positive impact of integrating the text messaging service into field level campaigns. USAID have funded studies into the original phase of the Wazazi Nipendeni campaign, when it was part of the Tanzania Communication Change Programme (TCCP) (Field-Nguer et al., 2014, TCCP 2014). As the partnership looks to the future, and entering into partnerships with new organisations, and working with an augmented content database that includes a large body of nutrition messages, there will be an ongoing need for up to date evidence on the value that the text messaging service adds. In this respect, impact research may well prove to be an important activity required to support the networking work of the PPP.

The importance of partners with a field presence has been well noted already – they add to the Value Proposition by providing health services and by reinforcing messages (see Section 5.2.4), they can act as a trusted channel for reaching women (see Section 5.3.2), and they can assist with acquisition (see Section 5.3.1). Information alone would have limited impact on health outcomes, given that the main thrust of the Wazazi Nipendeni campaign has been to encourage women to access health facilities, and it is these facilities that provide practical health services. Providing some kind of field presence, therefore, makes a material contribution to the overall Value Proposition.

The core business of delivering content to beneficiaries requires maintenance and development of the technical infrastructure that deals with registration, scheduling, and despatch of messages to users. This is handled by the mHealth Tanzania PPP and their subcontractors (including the applications platform provider), as well as the MNOs that support the service. It also requires ongoing maintenance of the content itself.

Any information on nutrition information and practices will need to be regularly updated to keep it relevant. For example, services that people can access through health service providers will change over time, new drugs and products will be introduced, and recommended practice will be modified as evidence continues to be generated and as scientific knowledge advances. People will quickly lose trust in information that is not immediately useful, or even worse, wrong. It is not clear that any of the partners has the mandate or the funding to do this type of ongoing maintenance.

Maintaining content is not a trivial business, as the quality assurance processes ought to be as rigorous as those adhered to during the mNutrition programme. It is not clear who will assume this role in the future. The mHealth Tanzania PPP clearly have an interest in keeping messages relevant and up to date, as do government departments such as the TFNC. TFNC have been involved in the quality assurance procedures, so would appear well placed to play this role, but it will take resources. This is the reason the score given in Table 4 for predictability of resources needs has been moderated to 4.

Airtel has a number of mHealth services, such as health tips, and they have looked into health insurance facilitated by mobile payments systems, although nothing concrete is planned for the

<sup>21</sup> <http://sbs.strathmore.edu/blog/2014/07/22/guidelines-business-africa/>



future. Health related services are treated with a good deal of caution, partly due to the controversial nature of health. People may rely on any information, which may have life threatening consequences, so it is important to get it right. There are, therefore, many hoops to jump through, such as expert medical input, and approval from the Ministry of Health – exactly the processes pursued in the development of the mNutrition content.

### **Prelude to Learning**

It is not clear that any of the partners currently has responsibility for curating content in the future, although this may arise as an issue to be addressed during the evaluation period.

Barriers to introducing mHealth services are high, and MNOs are cautious; however, this may change as the telecoms and VAS industries develop.

## **5.9 Key Partnerships**

*“The network of suppliers and partners that make the business model work. Companies forge partnerships for many reasons, e.g. reduce risk, acquire resources.” (Table 1).*

This section looks back over the life of the product and describes how the complex network of partnerships that now exists has developed. The issues considered roughly reflect the key Resources required to create the value proposition.

### **5.9.1 A complex network of partnerships**

The complex set of partnerships brokered by the mHealth Tanzania PPP and TFNC is a defining feature of the Wazazi Nipendeni service. Organisations that have contributed to the development of the Wazazi Nipendeni text messaging service (prior to the mNutrition project) are illustrated in Figure 6. The precise nature of each of the relationships represented in the figure have not been explored at this point, but the general nature of relationships covered by each category of partners are presented in Table 2, and the role of each organisation is described in more detail in the rest of this section. The demarcation in this analysis suggests clear roles for different partners, so a positive score (of 4) has been given for both balance between partners and working relationships between partners in Table 4. Organisations currently contributing to Wazazi Nipendeni through the mNutrition project have been described separately in Section 4.4. One of the issues to be explored during the evaluation is the influence that these organisations have on the continuing evolution of the service.

**Table 2 What parties give and get from Partnership relationships**

Partnership	Contribution of parties		Type
	1st set of partners	2nd set of partners	
JHCCP / CDC / PMI / PEPFAR - WN	JHCCP/CDC/PMI/PEPFAR: funding, technical assistance	WN: access to women, effective behaviour change communication channel	Donor
MoHSW - WN	MoHSW: legitimacy, authorisation, content	WN: help deliver nutrition strategy, access to women, effective behaviour change communication channel	Partnership
CDC - Cardno	CDC: Cash	Cardno: management expertise	Contractual

WN – mass media campaign agencies	WN: Cash	Agencies: technical expertise	Contractual
WN – Mobile content partners	WN: access to women, add value to existing content developed by partners	Partners: content, technical expertise	Partnership
WN – Tech providers	WN: ICT deployment opportunity, project funding	Tech providers: technical expertise	Partnership
WN - MNOs	WN: indirect benefits (CSR, loyalty)	MNOs: free SMS	Partnership
WN – Implementation partners	WN: access to women, effective behaviour change communication channel	Partners: field presence	Partnership

N.B. in this table, Wazazi Nipendeni is used synonymously with the mHealth Tanzania PPP.

### 5.9.2 Beginnings and initial funding

Phase 1 of the Wazazi Nipendeni programme, launched in 2012, was initially developed in coordination with the Tanzania Capacity Communication Project (TCCP), a programme led by Johns Hopkins Center for Communication Programs (JHCCP) in partnership with Media for Development International. The project worked closely with the Tanzanian Ministry of Health and Social Welfare (MOHSW), including the National AIDS Control Program (NACP), National Malaria Control Program (NMCP), Reproductive and Child Health Section (RCHS), and Health Promotion and Education Section (HPES). The project also worked with the Tanzania Commission for AIDS (TACAIDS), regional and local governments and health management teams, other USG implementing partners, and local non-government organisations and private sector organisations (JHCCP, 2017). The project created multiple behaviour change communication programmes in Tanzania, using methods as diverse as TV drama series, radio distance learning for community health volunteers and several integrated mass media campaigns. One of such programmes created was Wazazi Nipendeni.

The Wazazi Nipendeni campaign was funded by the US President's Malaria Initiative (PMI) and the US President's Emergency Plan for AIDS Relief (PEPFAR) (USAID, 2014) and implemented through US government agencies USAID and CDC, although funding for the text messaging service came through CDC. Technical assistance was provided by CDC (Advanced Development for Africa, 2013). The campaign was developed with the Safe Motherhood Working Group of the Ministry of Health and Social Welfare's (MoHSW) Reproductive and Child Health Section (RCHS), in coordination with the National Malaria Control Program (NMCP), the National AIDS Control Program (NACP), the Health Promotion and Education Section. The mass media campaign was developed by JHCCP, while the SMS component of the campaign was led by the mHealth Tanzania Public Private Partnership.

### 5.9.3 Research and Design

Although Wazazi Nipendeni was originally conceived as a prevention of malaria in pregnancy campaign, the initiative was expanded to include several key safe motherhood behaviours, including early and complete antenatal care attendance, HIV testing, PMTCT, and safe deliveries (Health Compass, 2016). JHCCP conducted an analysis of the 2010 Tanzania Demographic and Health Survey (DHS) in February and March 2011, revealing the high rate of preventable morbidity and mortality amongst pregnant women, and a link between prevention of malaria and healthy pregnancies. The team conducted a stakeholder review of barriers to healthy pregnancy and decision tree modelling to understand household-level decision-making around net use, ANC attendance, and SP uptake (Health Compass, 2017). This research shaped the campaign's design



and creative brief, 'which outlined the campaign's goal, objectives, target audience, messaging approach, communication channels, timeline, and key monitoring and evaluation indicators' (Health Compass, 2017).

JHCCP designed the campaign in March and April 2011, with objectives based on guidelines created by the MOHSW, and their own research and analysis of the DHS data. They then put out a request for proposals to local advertising agencies to help to design the campaign. The selection of these agencies took place in May and June 2011. This was followed by a process of testing and retesting campaign ideas in focus group discussions and interviews. This brought about the Wazazi Nipendeni messages targeting new or expectant mothers and fathers. Many materials were developed including television and radio spots, a radio jingle, billboards, a reality television programme and a printed magazine. Also developed was a range of promotional materials such as stickers and spare tyre covers, as well as more practical items for use by staff in health facilities, such as an individual birth planning brochure and planning poster, SP poster and reminder cards, individual birth planning and antenatal care cards, and pregnancy wheels.

One component of the Wazazi Nipendeni campaign was the text messaging service, implemented by the mHealth Tanzania PPP. Development of this component began in April 2012, following the approval of the mass media content by the MOHSW and JHCCP. This partnership was originally managed by the US CDC foundation, but has since been contracted to Cardno Emerging markets under a five-year contract running to 2020. This means that revenues are predictable, at least up to 2020, so a positive score of 3 has been given in Table 4. However, funding beyond this point is uncertain, so a negative score (of -1) has been given for recurring revenue streams.

#### 5.9.4 Mobile content

The content development for the SMS component of Wazazi Nipendeni was led by the MOHSW. Messages were developed in line with government recommendations on several pregnancy and motherhood related topics. The content team initially crafted messages using the exact recommended language in the Tanzanian public health guidelines. These were then cross referenced with the timing guidelines provided by the World Health Organisation (WHO) to determine the appropriate timing of specific messages. Workshops were held with technical experts and supporting partners to review the draft messages and check for technical clarity and simplicity.

Further content was leveraged from the Mobile Alliance for Maternal Action (MAMA). MAMA is another public-private partnership, launched in May 2011 by USAID and Johnson & Johnson with supporting partners, the United Nations Foundation, the mHealth Alliance, and BabyCenter. BabyCenter created adaptable messages for MAMA, based on behaviour change communication research and guidelines provided by WHO and UNICEF. These messages are open access, and have been used by several mHealth programmes.

*'MAMA offered these messages to the mHealth Tanzania Partnership at no charge, based on the Partnership's commitment to delivering health information via mobile phones to expectant and new mothers in Tanzania. An Adaptable Message Advisory Board, made up of midwives, nurses, and physicians who work in low resource settings, has approved the message content for BabyCenter and MAMA' (MAMA, 2013).*

Content on family planning was leveraged from another pilot - mobiles for reproductive health (m4RH). This project was led by FHI 360 with the MOHSW and funded by USAID. Again, messages were based on National Guidelines from the MOHSW, and International guidelines

provided by the WHO. Content for PMTCT was designed by the Elizabeth Glaser Pediatric AIDS Foundation (EGPAF).

These messages were then adapted for clarity and appropriateness to the local context:

*‘Over a several month period, the Partnership completed a review of all text messages with key sections of the Ministry of Health and Social Welfare (MoHSW) as well as with technical non-governmental health sector partners. MoHSW message review participants included members from the Communications Unit, National Malaria Control Programme, Reproductive Child Health Services, Health Promotion and Education Section, PMTCT Unit, National AIDS Control Programme, Tanzania Commission on AIDS, Muhimbili University of Health and Allied Sciences, Tanzania Food and Nutrition Centre, and more. Health sector message review partners included the Johns Hopkins Bloomberg School of Public Health (Communication and Malaria Initiative in Tanzania –COMMIT and Tanzania Capacity and Communication Project - TCCP), Elizabeth Glaser Pediatric AIDS Foundation (EGPAF), FHI 360, Mwanzo Bora Nutrition Program, Piga Debe (a private consultancy company) and Jhpiego (an affiliate of Johns Hopkins University)’*

(MAMA, 2013).

The role of the technical working group for social behaviour change communication (SBCC) for nutrition in approving content was mentioned in Section 5.2.2. The TFNC were instrumental in brokering these links, given that they conducted the nutrition landscape analysis that paved the way for the Nutrition Social Behaviour Change Communication Strategy, they are on the Secretariat of the High Level Steering Committee on Nutrition, and they chair the technical working group itself (MoHSW 2013).

### 5.9.5 Technology Platform

Text to Change Mobile (TTCM), an organisation with expertise in designing mobile solutions to information dissemination problems, designed the SMS platform used by Wazazi Nipendeni. In partnership with the Praekelt foundation, TTCM developed ‘Vusion,’ an open source SMS platform. *‘The platform has been designed to enable campaign managers to configure complex SMS programs without the requirement for code changes or development support. This means campaigns can be setup within hours or days, instead of months or years’* (TTC, 2017). For Wazazi Nipendeni, the target participants can send the word “mtoto” (‘child’ in Swahili) to the number 15001, which is free of charge on all mobile networks.

The architecture of the original system involved upstream links to the TTC Mobile servers in the Netherlands, and downstream links to an aggregator, and then on to the MNO networks. The number of links in the communications chain had implications for reliability, latency, and cost. It was, therefore, decided to invest in a new platform that was developed by a local software company (Rasello), to be hosted locally. This platform was commissioned and paid for by the Ministry of Health (with CDC funding). The service was migrated to the new platform in October 2016, which then offered enhanced monitoring and reporting features, and was able to connect directly to MNO gateways without the need for a local aggregator. Although Wazazi Nipendeni remains the largest SMS single service, the platform runs multiple services run by the mHealth Tanzania PPP and, as it is managed by the Ministry of Health, provides an opportunity to host future government mHealth services.

#### Prelude to Learning

The new government platform offers opportunities to host future mHealth services. To what extent will the government exploit these opportunities, and how will this impact on the functioning of the mHealth Tanzania PPP?

### 5.9.6 Telecoms Operators (MNOs)

The mHealth Tanzania PPP had identified MNOs as key partners and were keen to get them involved from the start of the initiative. However, they proved to be tough negotiating partners in that they needed to be convinced of the viability of the concept before committing. In the end, the Wazazi Nipendeni campaign was launched without explicit support from MNOs. It was after the service proved itself by attracting 100,000 subscribers within 11 weeks, and after it gained recognition by being nominated for a GSMA Global Mobile Award in 2014 that MNOs were convinced, and even started approaching the mHealth Tanzania PPP.

Tanzania has eight mobile networks, with three major mobile operators; Airtel, Vodacom, and Tigo (see Section 3.1). All of these major operators plus Zantel (which has recently been acquired by Tigo) have agreed to zero rate Wazazi Nipendeni messages. *'Airtel Tanzania was the first mobile network to 'zero rate' the service for text messages to and from Airtel subscribers on a provisional basis for two years. The program's sustainability was further strengthened mid-2014 when Tigo, Zantel and the Vodacom Foundation implemented a 'zero rating' agreement for HPHB messages to and from their respective subscribers'* (IT News Africa, 2016). All operators zero rate the messages through their CSR departments, although the arrangement with Vodacom is made through the Vodafone Foundation, which then pays Vodacom for texts sent.

#### **Prelude to Learning**

MNOs zero rate messages as part of their CSR activities. However, MNOs are being encouraged to take a more commercial view of their investment, which would help place their continued involvement on a more secure footing.

### 5.9.7 Implementation partners

The programme launched in November 2012. An initial media blitz 'ran 6-12 radio spots per station per day on 16 national and regional radio stations, and three spots per station per day on six TV stations. The initial, intensive campaign period continued through the end of December 2012, then entered a maintenance phase from January to March, 2013. After a three-month break, the campaign resumed broadcast from July 2013 – February 2014' (Health Compass, 2017). At the same time, several 'on the ground' partners promoted the event, and helped women to register for the service. EGPAF supports 1300 health facilities in Tanzania, and therefore leveraged its existing connections to train health workers on the content of Wazazi Nipendeni messages and assist women in enrolling on the services. Similar assistance with enrolment at healthcare facilities was provided by Aga Khan Health Services Tanzania – Joining Hands Initiative (AKHST– JHI) (funded by the Department for trade, foreign affairs and development, Canada), Afya Connect for change, Pharmaccess and the Walter Reed Programme (TTC, 2017). Several NGOs, such as Mwanzo Bora, incorporated promotion of Wazazi Nipendeni into their existing healthcare promotion activities. Print materials for the campaign were distributed by regional and district health management teams, who delivered materials to health facilities during their monthly supportive supervision visits.

The Wazazi Nipendeni partnership model is based on working together with health and nutrition interventions in the country. Partnerships may be formal, as is the case with most of the examples given above, but others may be informal. As time goes by, more people will be aware of the Wazazi Nipendeni text messaging service and what it can offer. For example, D-Tree (a non-profit organisation) is an alternative mobile health service provider in Tanzania, yet they have incorporated Wazazi Nipendeni into their system. When enrolling a client, they ask consent to receive health messages, then they port that phone number into the Wazazi Nipendeni API so clients are auto-enrolled onto the Wazazi Nipendeni platform. When demonstrating the D-Tree dashboard, a chart showed that 20% of women had their own phone, 15% had access to a partners' phone, and a further 5% had access to another phone, i.e. roughly 40% had access to a phone. Furthermore, around 35% of women consented to receive Wazazi Nipendeni content, i.e. roughly 90% of eligible women wanted to be enrolled on Wazazi Nipendeni. Although there may be alternative reasons behind this figure, it does tend to confirm that the Wazazi Nipendeni service is well regarded. So too does the fact that D-Tree have effectively endorsed the service. There is a synergy between the two services. Whilst Wazazi Nipendeni works to increase demand for MNCH services by encouraging women to get professional care, the D-Tree product helps ensure that once there, women will get a high quality of care, which will in turn encourage them to return for further care (and encourage their friends to go).

TFNC are currently making plans for an official launch of the revised Wazazi Nipendeni service, including the nutrition content, for August 2017. This will provide an opportunity to present the new service (and content) to the health community, particularly institutions working in nutrition, with a view to attracting interest from potential partners.

### ***Prelude to Learning***

Partnerships with agencies working in the field has become a key feature. It is expected that as the nutrition content is launched, more partnerships will be added to the 'portfolio'.

## **5.9.8 Partnership with Government**

The commitment of the Government of Tanzania to a number of policy initiatives addressing maternal health lies behind their continued support for Wazazi Nipendeni. Improving maternal health was Goal 5 of the Millennium Development Goals (MDGs). Targets included a reduction in maternal mortality and universal access to reproductive health services<sup>22</sup>. Health ministers from across the African Union met in Mozambique in 2006 and agreed on the Maputo Plan of Action as a framework for addressing sexual and reproductive health. It was motivated by a recognition of reproductive health needs across the continent, and a need to meet with the MDGs and the International Conference on Population and Development (ICPD) goals. A further African Union meeting of Health ministers in 2009 then launched the Campaign on Accelerated Reduction of Maternal Mortality in Africa (CARMMA), which directly addresses the other target set for MDG Goal 5. The president of Tanzania launched the national CARMMA campaign in 2011, and the Wazazi Nipendeni Safe Motherhood Campaign was part of operationalising the government's commitments under CARMMA.

2011 was also the year that the Tanzanian government joined the Open Government Partnership, a platform for those committed to making their governments more open and accountable. Tanzania's focus was on the health, education, and water sectors, with a commitment to give

<sup>22</sup> <http://www.un.org/millenniumgoals/maternal.shtml>

citizens access to information freely<sup>23</sup>. The Ministry of Health went on to publish an eHealth strategy for the country in 2013 (MoHSW 2013b). One of the strategic goals is to “Enable electronic access to appropriate healthcare services for patients in remote, rural, and disadvantaged communities”, and it describes strategic objectives relating to eHealth solutions, including one specifically targeted at child and maternal mortality:

*“SO7. Enable electronic delivery and interventions of health services to reduce child mortality; maternal mortality; and the burden of HIV/AIDS, TB, malaria, and non-communicable diseases.” (MoHSW 2013b).*

Wazazi Nipendeni clearly fits this mandate, and indeed President Kikwete referred to Wazazi Nipendeni as an example of how the health ministry is providing information to citizens at an Open Government Partnership conference<sup>24</sup>.

Looking to the future, the African Union has recently issued a revised Maputo Plan of Action 2016 – 2030, which renews commitments to addressing sexual and reproductive health. Since the origins of Wazazi Nipendeni, with its roots in CARMMA and the first Maputo Plan of Action, nutrition has subsequently become a priority for the Tanzanian Government. Tanzania joined the Scaling Up Nutrition (SUN) Movement in 2011 and has since launched several national strategies (Barnett & Srivastava 2016), such as the National Nutrition Social and Behaviour Change Communication Strategy 2013 –2018. This suggests that there will be continued demand for communication of information on maternal health, and growing demand for nutritional behaviour change communication programmes. TFNC are mandated to coordinate various institutions conducting nutrition programmes in different parts of the country. This provides them with an opportunity to promote the integration of Wazazi Nipendeni into these programme activities. In this way, they can extend assisted registration in certain regions. TFNC already provide technical training for field agents (as part of these nutrition programmes), so it would be easy to incorporate Wazazi Nipendeni registration into training curricula. The integration of the nutrition content from the mNutrition programme into the Wazazi Nipendeni content may prove to be particularly timely.

Strong support from government, and the successful engagement of implementing partners suggests that support for the service (including financial support) is likely to continue to be forthcoming, so positive scores have been given in Table 4 for sustainability of revenue streams, and for danger of losing partners (i.e. little danger), and competing healthcare priorities (i.e. nutrition is high priority). The close fit of the service with a range of government policies, and synergistic relationships with implementing partners, is reflected in a strongly positive score in Table 4 for synergy of partnerships.

### **Prelude to Learning**

Government participation has been a feature of Wazazi Nipendeni since its inception, and this has involved multiple, and changing, government departments. The complexion of government involvement may change further over the forthcoming years.

<sup>23</sup> <https://www.opengovpartnership.org/countries/tanzania>

<sup>24</sup> <https://tz.usembassy.gov/tanzanias-maternal-health-early-child-care-text-messaging-service-enters-3rd-year-half-million-registrants/>



## 5.10 Cost Structure

*“Costs incurred to operate the business model. Creating and delivering value, maintaining customer relationships, and generating revenue all incur costs.” (Table 1).*

Where possible, the team has collected and collated the costs for the Wazazi Nipendeni service. These costs, particularly ongoing ones, have and are likely to change as the service offering is adjusted. Some cost data is incomplete, and with the introduction of a new platform the ongoing costs are likely to change. As a baseline then, we have ‘sketched’ the costs in order to identify the gaps to be filled during the coming months. Wider mNutrition programme costs, historical investment costs, and wider social costs are considered in the accompanying baseline report on cost-effectiveness (Batchelor et al., 2017). So as not to be continually adjusting this report in the light of the dynamic changes of the service, all costs are taken as at March 30<sup>th</sup> 2017, the end of the data collection phase.

When considering Setup and Ongoing costs only:

- **Localisation Content development.** mNutrition as a whole has been funded to develop and collate a global repository of nutrition information. In order for this to be applied to Wazazi Nipendeni there had to be a localisation process; taking the global fact sheets and making them relevant to the clientele of Wazazi Nipendeni. This involved a number of partnerships which will be discussed below.
- **User experience (UX) testing, Baseline, Monitoring and Evaluation.** Resources and personnel needed for user experience research, baseline surveys, monitoring and evaluation. We include here the baseline surveys and UX surveys required to design the specifics of the service, and the ongoing mechanisms of feedback to keep the service relevant to users and to keep stakeholders apprised of the service’s effects (impact for public good). It could be argued that the UX surveys are a part of the product research and development, which we have modelled as a wider programme cost. However, if a similar service utilising the experience of Wazazi Nipendeni Tanzania and the global content created by the mNutrition programme were to be set up in another country, there would need to be UX surveys to inform the service shape and form, and to contribute to the localisation of the content.
- **Capital costs.** Cost of any infrastructure created to support Wazazi Nipendeni. For example, the service was initially based on the Vusion platform developed by TTC Mobile, which interfaced through a local aggregator to each of the partnering MNOs. The mHealth Tanzania PPP and the government subsequently invested in the development of a bespoke platform designed to improve performance and reduce costs, and the service migrated to the new platform late in 2016. These capital costs are not yet available. Introducing a service offering in a new country would likely require some capital equipment to strengthen infrastructure.
- **Management/ Personnel costs.** The ongoing service requires expenditure on staff and management. MNO overheads could be incorporated here. Personnel costs need to include any engineers required to maintain the platform.
- **Promotion and marketing.** This includes two principal activities. Firstly, Wazazi Nipendeni mainly works through other NGOs (and government health facilities) by providing an information service that supports ‘on the ground’ campaigns, so the cost of these campaigns needs to be taken into account. Secondly, mHealth Tanzania PPP staff provide training of partners’ in-country personnel, incurring costs for transport for trainers, hours of labour etc.
- **Recurrent costs of messaging.** On the face of it one of the simplest costs is the price assigned to the text messaging. Each message has a cost associated with it. Message scheduling and despatch platforms will also incur ongoing maintenance costs. Who pays this cost is a more complex question.



- **Content curating.** There is an ongoing need for updating the content of the messages. Information can get out of date and there is a need to ensure that the health and nutrition information remains relevant.

GSMA prepared for its involvement with mHealth by commissioning a financial forecast model from Palladium<sup>25</sup>. They anticipated some of the costs and anticipated a cost per user. This was seen as potentially a policy tool on which to hang discussions with potential partners and government. Subscription uptake used in the model was actually less than Wazazi Nipendeni's current experience, and would suggest that Wazazi Nipendeni is doing well in its implementation.

Due to the complexity of the Wazazi Nipendeni partnerships, the nature of the nutritional component building on what has gone before, and the lack of a single budget for the intervention, it has been difficult to draw out the relevant costs. In Table 3 we outline the costs we continue to seek. At the completion of the data collection few actual costs were available although more detail about costs has been promised. Figures in Table 3 have, therefore, been based largely on estimates based on authors' assumptions, along with high level figures provided by GSMA, CABI, and Cardno.

**Table 3 Baseline costs for Wazazi Nipendeni**

	Partners involved in expenditure	Source of data	Detail	Year 1	Year 2
Localisation Content development.	GSMA, COUNSEUT, Every1Mobile, TFNC, Ministry of Health, mHealth Tanzania PPP	Global content financial report (Tanzania costs only)	Staff Costs	£13,399	£6,904
			Direct Costs	-	-
			LCP payments	£16,599	£45,869
Product development (UX, M&E, BI)	ThinkPlace, frog, Altai, Cardno, GSMA	GSMA, estimates	Cancelled contract with Johns Hopkins		
			Monitoring & Evaluation (Altai)	£53,109	£53,109
			UX expert and design consultants	£66,962	£66,962
			Business Intelligence (GSMA)	£47,704	£47,704
Capital costs.	GSMA, Wazazi Nipendeni Team, mHealth Tanzania PPP, Ministry of Health, HNI	Assumed costs from Financial model	Server platform for messaging, set up cost	£1,923	

<sup>25</sup> The work was originally carried out by Futures Group, which was subsequently taken over by the Palladium Group.

	Partners involved in expenditure	Source of data	Detail	Year 1	Year 2
Management/ Personnel costs.	GSMA, Wazazi Nipendeni team, Government, Cardno, mHealth Tanzania PPP, TFNC	estimates	Assumed team of 4 paid for by CDC, Package costs, 30% of time.	£94,286	£94,286
		estimates	Assumed 20% time of key Government staff (3)	£28,286	£28,286
Promotion and marketing.	mHealth TZ PPP, partner NGOs	Estimates of costs for training & NGO personnel.	Training of NGO personnel	£5,143	£5,143
			Implied extra cost for NGO	£25,714	£25,714
		mHealth TZ PPP data	Training expenses	£33,846	£33,846
			Zero rated USSD sessions	£9,833	£9,833
Recurrent costs of messaging.	MNOs *4 Airtel, Vodacom Foundation, Tigo, Zantel	Calculated from mHealth TZ PPP data, Financial model, plus estimates	Zero rated SMS valued at market value	£334,296	£367,714
			Payment to aggregator	£18,462	£18,462
	Aggregator		Short code licence fee	£3,692	£615
	Platform		Cloud server for SMS		£16,615
	Wazazi Nipendeni team		Annual Systems administration	£26,585	£26,585
Content curating.	Wazazi Nipendeni team	From Financial model	Translation (inc in content LCP above)		
			Updating	£1,071	£1,071
			Totals	£780,901	£848,720

Only the cost of message scheduling and the cost of sending the SMS messages themselves have been assumed to be variable costs. These costs have been based on estimated average numbers of users of 200,000 in Year 1, and 220,000 in Year 2. If we assume an attrition rate of 20% at the end of Year 1<sup>26</sup>, then out of the 220,000 users in Year 2, 160,000 continued using the service from the previous year, and 60,000 would be newly registered in Year 2. The total number of people using the system over the two-year period would then be 260,000 (200,000 in year 1 plus 60,000 new registrants in Year 2). This would give a figure of £6.3/user. If it can be assumed that there is no material cost to the MNOs of sending the SMS messages, then this ratio drops to £3.5/user. Although interesting, these figures tell us nothing about value for money as they take no account of impact achieved.

<sup>26</sup> 20% was assumed in the financial forecast model from Palladium.

With the caveat that the figures in Table 3 are based largely on assumptions and estimates, a number of points arise from the relative magnitudes of categories of costs:

- The value of SMS messages delivered accounts for almost one half of operational costs<sup>27</sup>. Even if bulk purchasing meant that these costs could be halved<sup>28</sup>, they would still represent the largest single cost component, which emphasises the importance of private sector partnerships to the continued operation of the service. Total costs are, therefore, highly dependent on the in-kind contribution made by MNOs, so a negative score (of -2) has been given for consistency of costs in Table 4.
- Technical costs represent another large cost component (e.g. aggregator fees, systems administration). As a largely fixed cost, this can be spread across hosted services. If the government introduces additional mHealth services, these costs can be diluted. As fixed costs, these are largely predictable, so a score of 4 has been given in Table 4.
- Another large component is personnel costs. Given the specific set of networking skills present in the mHealth Tanzania PPP, it is unlikely that a government department (or any other party for that matter) could simply appropriate the service using their existing staff; the costs of a dedicated, specialised team would need to remain.

Given that most costs are fixed, and not tied to the number of users, potential economies of scale are huge if large numbers of users can be registered. However, numbers may be limited in practice by the volume of messages that MNOs are willing to pay for, so a neutral score (of -1) has been given for cost growing disproportionately in Table 4. Nevertheless, a positive score (of 4) has been given for economies of scale in Table 4. More discussion is held in the accompanying report on cost-effectiveness.

## 5.11 Investment

*“Number of investors, type of investors, and commitments made to investors. These will influence acceptable profit margins, and may affect cash flow.” (Table 1).*

Although a large number of organisations have invested in Wazazi Nipendeni and the text messaging service over the years, they have done so on a grant or expenditure basis, i.e. there is no expectation of receiving any financial return on this investment. From a financial perspective, these can be considered as sunk costs, as the money has been spent on service development (e.g. adding content) and delivery (i.e. sending out messages), and no organisation will make any claim to recover them in any way.

Most of the funding sunk into development of Wazazi Nipendeni has come from donors, which justify project costs incurred over the duration of the project in terms of the outcomes achieved, rather than in any kind of financial return. The mHealth Tanzania PPP was originally set up as a local organisation to implement mHealth services, and was funded by CDC. As an example of an associated programme, the original TCCP project led by the Johns Hopkins Center for Communication Programs (JHCCP) was a five-year project funded by USAID. The investment in Wazazi Nipendeni was justified in terms of what Wazazi Nipendeni contributed to the overall goals of the project:

<sup>27</sup> These are based on a ‘market’ value of 65 TZS/SMS, which is the weighted cost calculated from MNO contributions reported by Cardno.

<sup>28</sup> Bulk SMS providers offer SMS at less than 30 TZS/SMS e.g. [www.sms.co.tz](http://www.sms.co.tz)

- “to increase the adoption of safer behaviours by Tanzanian adults and high-risk populations (adults and youth) in the areas of HIV prevention and treatment, family planning, maternal, newborn and child health, and malaria
- to build the capacity of Tanzanian individuals and institutions in Social and Behaviour Change Communication (SBCC) skills,
- to improve the coordination structures for the implementation of SBCC activities.”

(JHCCP 2017).

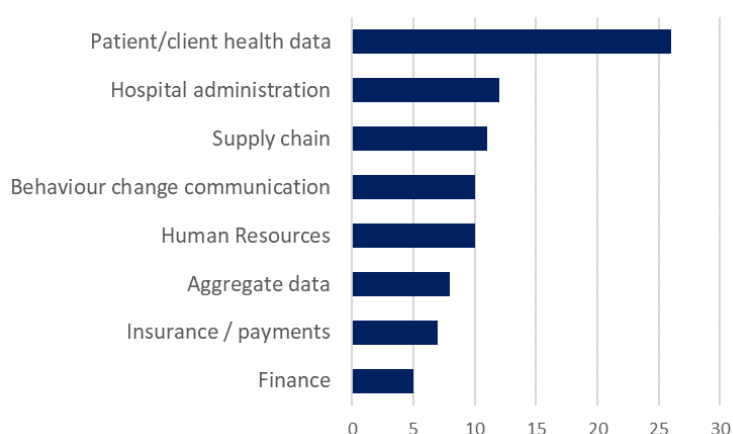
While the above costs in section 5.10 are a ‘sketch’ of the local setup and ongoing costs, the wider mNutrition programme costs and the historical investment costs are considered in the accompanying baseline report on cost-effectiveness.

## 6 Alternative Approaches in Tanzania

### 6.1 mHealth VAS Context

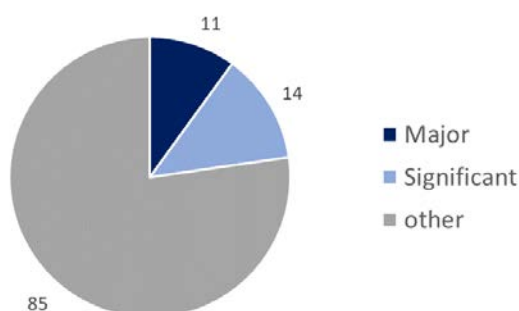
There is an informal mHealth Community of Practice in Tanzania, which has around 100 members. The chair of the community of practice was kind enough to share a database inventory of projects, which contains 110 projects, although this includes instances of multiple versions of a single product, e.g. a financial system includes an administration product, a registration product, and a claims management product. Figure 19 shows that the majority of applications were designed to assist with administrative tasks of one sort or another, e.g. patient data, administration, aggregate data, supply chains, and human resources. It also shows 10 behaviour change communication projects, so a negative score (of -2) has been given for both the novelty of the service and the uniqueness of the value proposition (i.e. other services are available). However, Figure 20 goes on to show that less than one quarter are regarded as having reached any kind of meaningful scale. Of the 11 projects classified as having major reach, four deal with finance and insurance, six address various aspects of administration, and the one behaviour change communication programme is Wazazi Nipendeni. This suggests that although there is a lot of interest in mobile health applications in Tanzania, few have reached scale, so it is difficult to find similar products to compare with Wazazi Nipendeni. This lack of obvious competition in the near future lies behind the positive score (of 2) in Table 4 for both competition intensifying and customer switching.

**Figure 19 Most common types of mHealth applications in Tanzania<sup>29</sup>**



Authors own

**Figure 20 Scale of mHealth applications in Tanzania**



<sup>29</sup> Categories containing 5 or more projects from the mhealth Community of Practice inventory (2017).

*Authors own*

The Community of Practice is trying to harmonise efforts and avoid duplication, but there is a lack of coordination from government. This is a result of multiple government departments concerned with different aspects of health (e.g. paediatrics, HIV, malaria, nutrition etc.), each of which do not talk to one another. An organisation starting a new initiative can obtain approval from one department, without being aware of similar programmes approved by another department. Once they have started working and invested in their new product, it is usually too late to stop.

The government acknowledges that there is a lot going on in the country, and the eHealth strategy explicitly acknowledges that there is a lack of coordination between ministries, and that there is a fragmented landscape of eHealth pilot projects and stakeholders (MoHSW 2013b). The eHealth strategy calls for data to be collected by multiple systems, and the responsible body is tasked with developing standards required to do this.

None of the projects in the Community of Practice database mention any of the MNOs as partners, which suggests that it may be oriented more towards NGO activities. There are other examples of initiatives supported by MNOs, such as the Vodafone 321 service, Vodafone's Mobilising Maternal Health project, and Tigo's birth registration service. Rather than travelling to registry offices and paying for a birth certificate, health workers can register the birth using the phone and the certificate is issued free of charge. The service has been developed as a partnership between the government registration agency, UNICEF, and Tigo (GSMA 2016). The Vodafone Foundation has recently launched an emergency taxi service to take women experiencing serious birthing problems to a hospital<sup>30</sup>. This is an interesting initiative because it takes advantage not only of widespread access to phones among women, but it also uses the M-Pesa mobile money platform to pay taxi drivers. It is difficult to say whether any of these services constitute a threat to Wazazi Nipendeni, or whether they many provide opportunities for complementing one another, so neutral scores have been given to threat of competitors and their threat to market share in Table 4. The Vodafone Foundation, for example, supports programmes that fit within the three sectors of their remit – education, health and financial inclusion.

## 6.2 D-Tree

D-Tree has developed a decision support tool that runs on low-end smartphones to help midwives track clients, and to improve the quality of consultations by ensuring that all checks are carried out in accordance with national guidelines. They make use of videos and picture content to show clients, but they use existing materials rather than create their own. The tool has been available for 5 years, and was initially developed for a UNICEF programme. Each time they have worked with a new programme, they have added functionality. Many of these programmes are the same ones that have partnered with Wazazi Nipendeni, e.g. Jhpiego (who use CHWs), EGPAF (who run community facilities).

D-Tree have done some work on the impact of their services. They have shown that healthy deliveries have increased from 33% to 77%. However, this was based on a package of support offered to women including counselling, escorting, and paying for transport to a health facility. This was rather expensive, especially the transport, so they are looking into more sustainable approaches. They have had difficulties with getting CHWs to use the system. They feel empowered after training and are excited to use the system in the field so activity starts off high but then tails off. They have had to develop a set of incentives that encourages CHWs to complete

<sup>30</sup> <http://www.vodafone.com/content/index/media/vodafone-group-releases/2016/maternal-health-tanzania.html>



forms. At the same time, they have developed the web interface software to spot suspicious behaviour (e.g. forms filled in at home, consultations that took only 5 minutes, and so on).

Partners typically contract D-Tree to provide services for only 1 or 2 years. Even if they have a 5 year contract, it can take 2 years to decide what to do and to get going, then they contact D-Tree and enter into negotiations, which can take another year, which leaves only 2 years to provide a service, and even then, the last few months are taken up tidying up and reporting. D-Tree's partnership model requires a lot of time and effort invested in networking and negotiating to secure contracts.

### **6.3 Implications for Wazazi Nipendeni**

The common feature of the services described is that they are based on partnerships that are mandated to achieve improved health outcomes. D-Tree and Wazazi Nipendeni are similar in that they provide a service that is part of a complementary package of activities that are designed to build the capacity of health workers (D-Tree) and to empower women (and fathers) with information on healthy deliveries and infants. Tigo's system is implemented in partnership with the government's registry service, which clearly has a duty to improve the efficacy of birth registrations. Similarly, there is no revenue stream associated with the pregnancy taxi service, but rather the Vodafone Foundation are keen to see lives saved. It can be argued that, in the same way as a profitable service will only be viable for as long as customers are willing to pay for the service, partnerships will only be sustainable for as long as the partners with a neonatal health mandate and, increasingly, a nutrition mandate, are present and operational in the country.

## 7 Discussion

Most of this report is dedicated to describing the range of aspects of the Wazazi Nipendeni service represented by the building blocks of the Canvas framework. In this section we draw on this understanding to propose a business model that represents the plan currently being followed to deliver the service. Having already described different aspects of the business model, in this section we go on to make qualitative assessments of each as a way of commenting on the strength of the model. We also highlight some assumptions that appear to be made in the business model, and comment on their validity. This is, by its very nature, a subjective exercise, but it draws on insights gained during the baseline activities of the evaluation. Finally, we consider major changes proposed that are likely to substantially change the business model.

### 7.1 What is the Business Model?

The business model can be simplified into a set of relationships between the main partners, as illustrated in Figure 21. In this analysis, Wazazi Nipendeni itself represents the partnership of the mHealth Tanzania PPP and the TFNC, which between them provide the mix of technical skills required to deliver messages and networking skills required to attract partners to the service. Both Wazazi Nipendeni and representatives of field partners provide services to users. While the Wazazi Nipendeni service adds value to partners' field level interventions, field agents help boost the number of users, and add value to the messages. Funders include bodies providing both direct funding (e.g. CDC) and in-kind support (e.g. MNOs, government ministries).

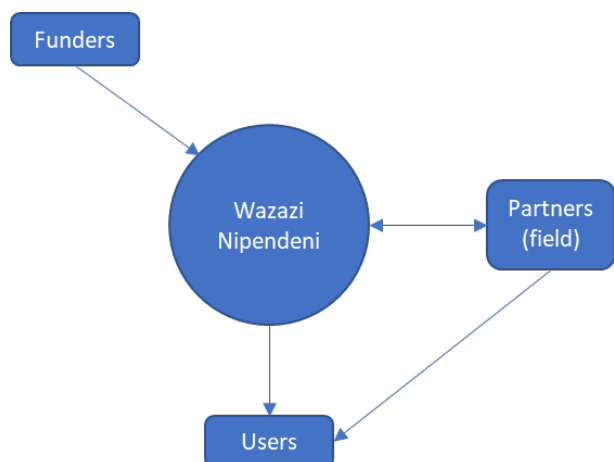
This can be regarded as a multi-sided platform business model, something that is commonly associated with information technology businesses. It provides a means of making a product free to one group of customers, while another group pays. Wazazi Nipendeni brings together two groups, providing a link between funders, who pay for the service, and users who receive the service for free. This is probably closest to a free newspaper model, in which advertisers are linked to readers through the paper; the paper is free to readers, and the advertisers pay the cost. Advertisers are motivated by a complex web of behaviour changes linking people reading adverts to purchasing products that eventually results in increased revenue for the advertising agency. In the Wazazi Nipendeni model, funders are motivated simply by improved health outcomes. Because the customers do not pay, the viability of the service does not depend only on the material (or perceived) benefit to individual users in terms of reduced health expenditures, deaths averted and so on. Rather, it depends on yielding wider benefits that are of value to the funding institutions. Where institutions have a mandate to improve health outcomes, the sum of benefits to the individual will be of value. However, health interventions often yield societal benefits in addition to benefits to the individual (e.g. vaccinations), which are of value to third parties such as governments and MNOs (better health means higher disposable income).

Field level partners cannot really be considered a third side to the platform because they already have their own link to users through their field presence. The relationship with Wazazi Nipendeni can be considered as a simple business to business transactional arrangement as described above – Wazazi Nipendeni provides a valuable service, and partners drive users to the system.

Driving up user numbers is also an important factor in multi-sided platforms – they depend on networking effects. Coming back to the free newspaper analogy, the willingness of advertisers to pay is directly related to the number of readers. In the same way, funders will only be prepared to support Wazazi Nipendeni if it is yielding sufficient benefit in terms of improved health outcomes, which is directly linked to the number of users.

At the time of writing, funding for Wazazi Nipendeni and the new platform comes from CDC, so it is a donor funded business model. However, new thinking is emerging on ways of using the platform to reduce costs, thereby reducing dependence on donor funding. The platform is owned by the Ministry of Health and has the potential to host multiple mobile health applications, which presents opportunities to recover, or at least spread the operating costs. How relationships with mHealth providers develop, what synergies develop from these partnerships, and the impact on service costs will be tracked over the next two years.

**Figure 21 Key partnerships (business model)**



*Authors own*

## 7.2 How robust is the Business Model?

Each of the building blocks described above has been assessed using a range of criteria presented in Table 4, each of which has been scored (using a Likert scale from -5 = very poor to +5 = very good). Subjective assessments have been made on the basis of information made available to date, and on feedback from reviewers. Overall trends arising from this subjective assessment include:

- High scores in infrastructure are mostly associated with the partnerships, which are a key feature of Wazazi Nipendeni. There is a clear synergy between partners, and between the Wazazi Nipendeni service and several government policies and commitments (e.g. on maternal mortality and reproductive health, and the Open Government Partnership). Principal threats are also associated with the nature of partnerships, and the fact that no one party has direct control over the activities of the other, with implications for quality and accountability.
- The partnership model results in mixed, and extreme scores for the cost / revenue assessment. This is because on the one hand funding from a small number of funders (direct and in-kind) through fixed term (five-year) agreements is guaranteed and secure, but on the other hand there is a good deal of uncertainty as to what may happen when these agreements expire. Another key constraint is the reluctance of the government to explore alternative revenue streams, although this thinking may change.
- The Value Proposition appears generally positive, mainly due to the positive findings from previous research into the Wazazi Nipendeni campaign; this will be revised in the light of findings from the quantitative research currently being conducted by IFPRI. Some scores are moderated simply because a substantial part of the Wazazi Nipendeni service now comprises nutrition messaging, yet the early indications are that this kind of information is not regarded by potential users as particularly relevant.

- The Value Proposition has also been scored down because neither the information nor an SMS platform are unique, but rather the strength of the proposition lies in the partnerships convened that have enabled Wazazi Nipendeni to reach scale, and to provide added value through synergy with other health services. This is reflected in some of the high scores given for channels and branding under Customer Interface.

**Table 4 Quality of Business Model - by Canvas Building Blocks**

Feature of Canvas Building Block	Score	Comment
<b>Value Proposition</b>		
VP well aligned with Customer information needs	3	some information gaps on breastfeeding; child feeding practices dismissed as not relevant because it needs money
VP matches customer segments	-1	service and campaigns include men, but it appears few men subscribe to the service
VP have strong network effects	3	word of mouth is the best way of getting people to sign up - through friends/family, but especially health workers
Synergies between elements	3	although WN offers single service, it reinforces messages from health workers, especially when integrated with interventions
Customers regard WN as good value	1	too early to tell. Historic user numbers and impact suggest good value, but nutrition content may be of less value
Customers acquire knowledge	2	too early to tell. Previous research suggests recall is good, but nutrition knowledge may not be so effective
Customers change behaviour	3	previous research showed behaviour change in ANC visits, birth plans, HIV testing and malaria precautions
Improved health outcomes	?	too early to tell
VP offers new service	-2	there have been plenty of SMS messaging services, but WN is only one in Tanzania to reach scale
Are substitute products & services available?	-2	people can get information from health facilities, but WN channel offers advantages; other mHealth services not at scale
Are competitors threatening to offer better?	0	new services are targeting very specific neonatal health issues (e.g. pregnancy taxi) - may complement or compete?
<b>Cost / Revenue assessment</b>		
Strong margins	0	not for profit model
Revenues are predictable	3	CDC commitment to 2020, the intention is to attract support from agencies with nutrition mandate
Recurring revenue streams	-1	funding comes through 5 year commitment - short term revenue stream is guaranteed, but longer term is uncertain
Revenue streams are diversified	-4	majority funding from 1 donor, constraints dictated by gov't policy, but there is new thinking on possible revenue streams
Revenue streams sustainable	4	WN presses many buttons (maternal mortality, open government, nutrition) and well connected - likely to find funding
Charge what users are willing to pay	-4	government policy prevents charging users at all - willingness to pay not explored
Are new technologies likely to impact revenues?	-1	rich interaction applications will displace SMS (long term future)
Costs are predictable	4	mostly fixed costs (SMS service), but user numbers and campaign costs will ebb and flow (costs met by partners)
Costs are consistent	-2	costs are vulnerable to MNOs pulling out of zero-rating agreements, or renegotiating terms

Feature of Canvas Building Block	Score	Comment
Costs are matched to the business model	?	hard to say - costs need to match perceived benefit of improved health outcomes
Operations are cost-efficient	?	hard to benchmark
Benefit from economies of scale	4	given most costs are fixed, huge economies of scale if large numbers can be attracted
Which costs threaten to grow disproportionately?	-1	acquisition costs are high (but met by partners), too high user numbers may lead MNOs to review cost of zero-rating SMS
<b>Infrastructure</b>		
Key resources are difficult for competitors to replicate	-2	both content and TTCM Vusion platform are open access; TFNC contacts are unique
Resource needs are predictable	4	it's a repeat product, but content will need updating
Deploy resources in right amount at right time	?	deployment is opportunistic, depending on field partner scheduling
Resources are adequate	-2	model relies to certain extent on partners' field activities and campaign design - represents a vulnerability?
Threat to quality of resources	-3	campaigns and TFNC are not under control of mHealth TZ PPP, networking depends on personalities, no guarantee content updates would adhere to same QC processes
Key activities are difficult to copy	4	network of partnerships is unique; content database is unique, BUT open source
Quality of executing activities	2	content has been added and is being scheduled; partners have been brought along
Balance of activities between partners	4	no duplication of effort, clear demarcation of activities
Synergy of partnerships	5	good synergy between core partners; product fits with multiple government policies
Good working relationships between partners	4	core partners seem to work well together
Danger of losing partners	3	CDC, government & MNOs are committed (at least near term), tech providers can be substituted, and field partners come and go
<b>Customer interface</b>		
Churn rates are high	-4	constantly need to register new pregnant women - high acquisition costs
Customer base is well segmented	-3	all segments get the same content
Continuously acquiring new customers	2	numbers remain buoyant
Competitors threatening market share	-1	Vodafone 321 has limited health content, but that is likely to grow, new niche services
Competing healthcare priorities	3	continued political commitment to reproductive health, emerging interest in nutrition (policy & donors)
How quickly will competition intensify?	2	no obvious competitors ready to go to scale in the near future
Channels are efficient	-1	field partners vary in capacity, as do government (and NGO) health clinics
Channels are effective	2	self-registration works well, but people prefer 2 way interaction, and some prefer voice messaging






Feature of Canvas Building Block	Score	Comment
Channels have good reach into customers	2	national reach, and most users self-register successfully, but field agents may only be available temporarily
Customers can easily see channels	1	high profile during campaigns, so depends on campaign design and funding
Channels strongly integrated	4	government and partners promote WN, WN messages reinforce work of local health workers
Channels provide economy of scope	3	nutrition content can be added to WN database at marginal cost as infrastructure is scalable, requires new contacts / networking
Channels well matched to customer segments	-1	men are expected to attend ANC, but it appears they are not being reached by field services
Channels at risk of becoming obsolete	3	not as long as people are using mobiles and visiting health facilities
Nature of Customer relationships	-1	impersonal relationship for self-registered users, but health information from government sources is trusted
Relationship quality matched to Customer segments	0	no differentiation of relationship by segment
Cost to customer of switching	2	no viable alternative service; VAS allegedly increases MNO loyalty
Brand strength	4	brand is strong, government endorsement engenders trust, and soft branding works well with parents
Customer relationships in danger of deteriorating	0	unlikely, given that most users self-register through an automated process.

## 7.3 Assumptions in the Business Model

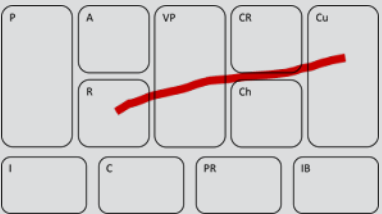




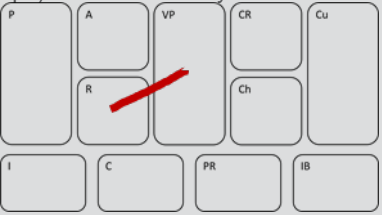

The narrative above describes each of the building blocks of the canvas, based on information accessed at this point. In this section we highlight a number of assumptions that appear to be implicit in the way the building blocks are intended to fit together to make a working business model. In Table 5, we have presented these as links between different building blocks, making comment on the validity of these assumptions, based on findings to date (drawn from a range of sources).

Perhaps the most important assumption in the partnership model is that the service will continue to be sufficiently attractive to funders, as, in the absence of revenue generation streams, this is the key to ongoing sustainability.

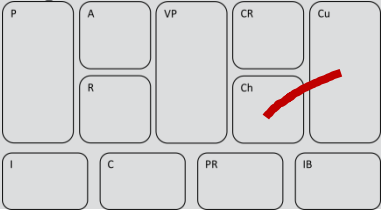




**Table 5 Comment on assumptions in Business Model**

	assumption does not appear to be valid
	assumption appears to be partly valid
	assumption appears to be valid

Canvas legend: P = Partners; A = Activities; R = Resources; I = Investment; C = Costs; VP = Value Proposition; CR = Customer Relationships; Ch = Channels; Cu = Customers; PR = Product Revenue; IB = Indirect Benefit.

Canvas link	Assumption	Comment	
Mobile phones will reach target customers 	Network will be available in rural communities	2 networks were available in Qual research communities, but these were only in 2 parts of the country. Coverage was generally good.	
	Households will have phones	Qualitative research found the majority of households own a working mobile phone.	
	The key customer segment (women) will have access to phones	Women are less likely to own a mobile phone, and men were opposed to the idea of sharing their phone with their wives, especially young, married women.	
	Phones will be working	Charging is a challenge, as most villages (rural Iringa) are not electrified. People take them to neighbouring villages. WN messages can still be received if phone has no credit. Number will be deactivated if SIM has no credit for 90 – 180 days. Hardware issues with phone were seldom reported.	
Knowledge base (health and nutrition tips) will be valued by customers 	Women will be able to act on tips.	Previous research on impact suggests that health information is well received, but indications are that regard nutrition content as low priority and not relevant.	

Canvas link	Assumption	Comment	
WN has the resources needed to maintain the Value Proposition	Content will be kept up to date	None of the partners has the mandate or the funding to regularly update content. This is only one weakness among many strengths.	
WN will increase customer loyalty 	MNOs will extract value from zero-rating messages (increased loyalty, positive brand image)	There is no evidence that MNOs have mined user data to demonstrate increased loyalty. Neither is there any evidence that MNOs promote their support for WN through marketing or promotional materials. On the other hand, MNOs seem committed to WN so CSR departments appear to be motivated by the health agenda.	
Customers will appreciate the value proposition 	Key customer segments will benefit from the value proposition	Previous research shows improved health outcomes, but it remains to be seen how the nutrition content will be received. The 'supporters' category of users has not been disaggregated for men, but the proportion of users is small, indicating that it is not reaching men. Users logs should be analysed to see if pregnant teenagers are accessing WN.	
	Improved health outcomes will attract funders	Both neonatal health and nutrition are key development sectors, likely to attract national scale interventions in the midterm future.	
	Users will comply with information	The partnership with government ministries is an asset as government health information is widely regarded as trustworthy.	
Reach of mHealth service will attract field partners 	WN gets sufficient user numbers	Figures from the TCCP showed it was possible to reach large numbers of women nationwide. The large number of partners to date suggests this is likely to continue to be the case.	
Partners will carry out activities 	Field partners will conduct multi-media campaigns	Too early to tell. Previous partnerships have been successful, but nutrition content has yet to be officially launched and integrated into nutrition campaigns.	
Generate revenue from customers 	Original concept expected users to pay for services (N.B. not an assumption for WN)	Policy in Tanzania (and other African countries) where health services are free at the point of delivery constrains revenue generation streams. There is new thinking on opportunities for charging third parties.	
Partners will make in-kind contributions 	MNOs will pay for messages	This is not really an assumption, because WN initially paid for messages though bulk purchase, but they had wanted to involve MNOs from the inception. However, now that MNOs have zero rated messages, it forms an important part of the cost structure.	

Canvas link	Assumption	Comment	
Integrated channels will add value 	Field workers will work with users to reinforce information	Health workers lack knowledge on nutrition so the reinforcing effect will be absent, diminishing the impact of messaging. Await findings from quantitative research.	
SMS as a channel	SMS is an appropriate medium for disseminating information	People use phones to both calls and SMS. Literacy rates are relatively high (85%), and people like the ability to re-read and share messages.	
Customers are competent with SMS	SMS service supports self-registration	Although people prefer assisted registration, the majority of users are self-registered, indicating the small number of registration questions is manageable. There is some question over differences in the quality of user experience, and compliance (research needed).	
Integration with health services	Using mobiles complements existing healthcare services	Mobiles can reach women in remote rural areas who visit health facilities infrequently. WN provides relevant information in a time manner, synchronised with the pregnancy.	

Looking at those links where implicit assumptions appear to be met, it can be seen that several relate to the context in which the nutrition messaging service has been launched. For example, mobile network coverage is good, phone ownership is high, and nutrition is currently rising up the development agenda. It also appears that the product is right in many ways – SMS appears to be an appropriate medium that is capable of attracting large user numbers, self-registration is viable, it complements health services, and government endorsement appears to be an asset. The mHealth Tanzania PPP has also successfully engaged the private sector (the MNOs) in the partnership, such that they shoulder what would be a large component of costs. However, it is assumptions relating to revenue streams that appear not to have been met. The principal issue is that of charging users, which is deemed to be at odds with government health policy; this would seem to be a high inertia barrier, so although the mNutrition project has stimulated new thinking, it is likely to take time for things to change. MNOs have not yet quantified indirect benefits arising from their in-kind contributions; again, thinking stimulated by the mNutrition programme may well lead to changes in the future.

## 7.4 Options for the future (what's likely to change?)

Wazazi Nipendeni is hoping to offer their services to any initiatives in behaviour change communication wishing to set up in Tanzania. Not only can they provide a platform to distribute messages and access zero rated SMS messages, but they can offer health content for free in addition to any subject specific content developed and distributed for the partner. However, they are proud of their status as a not-for profit partnership, and do not want to operate as a commercial company. The operation and control of the PPP will change in the coming years as the Ministry are becoming more actively involved in operational matters, and change may well be stimulated by new thinking as the end of the existing grant arrangement with CDC approaches.

The development of the new Ministry of Health platform has opened up a new world of opportunities for the mHealth Tanzania PPP. Having commissioned their own platform, they have control over how it is used, which means that they can host multiple services. To a certain extent

this was also the case with the Vusion system originally developed with TTCM, as this hosted multiple services, but the new platform gives them complete autonomy to host as many systems as they like. These opportunities are twofold. Firstly, they can offer to host services run by third parties, which presents opportunities for generating revenue. Secondly, attracting other services to the platform provides opportunities for establishing synergistic links to the Wazazi Nipendeni service.

The ability of the mHealth Tanzania PPP to capitalise on these opportunities depends on a stream of organisations setting up interventions in the country that wish to incorporate mobile services into their offerings. At the moment, there is some indication that this is likely to be the case. What is more uncertain is how long it may take to secure working agreements of the kind envisaged. It will be interesting to follow changes of the mHealth Tanzania PPP, to see how these partnerships evolve.

## 8 Conclusions

When GSMA started planning for mHealth activities as a part of the mNutrition programme of work, the ambition included a harmonising of mHealth pilots so that users in a country could have a single entry point. They hoped to aggregate all consumer facing health value added services through a single short code. This ambition contrasted with the mAgri approach which included grants to start and support new VAS products. Another component of the ambition was that such an aggregated service would be commercially sustainable.

In Wazazi Nipendeni (Mother and Child health supporting service), GSMA found the foundations of the vision. Here was a short code text based information service, already embedded in the government system, yet supported by donors and private sector contributions. It covered all the major MNOs, and had their support through their CSR units. It had endorsement from the very highest levels of government, and it had a 'co-operative spirit' working with other health providers as one element of integrated multimedia campaigns.

GSMA have been able to build on this foundation, by working with the Wazazi Nipendeni team and introducing the nutritional aspect. This has the benefit that mothers and children are retained for longer on the system, lowering the requirement for new acquisitions, and bringing a breadth to the information shared on the system. As a government-endorsed facility, while it may not aggregate all health activities in Tanzania, it nevertheless gives the consumer access through multiple MNOs via a single short code.

Part of the vision was for 'commercial sustainability'. The journey here is complex but still seemingly moving in a good direction. Understandably the government has declared that since health services are free in Tanzania, and this is effectively a health service, the consumer cannot be charged for accessing the service. While this on the face of it suggests that there is no direct revenue stream, and that it will forever need further donor or government funding and be in the CSR departments of the MNOs, there is emerging thinking on alternative models for revenue generation and for imputed benefits. The service supports other health activities and multimedia campaigns, and there is discussion now of how best to gain revenue from a more diversified set of donors and NGOs for that supporting service. Experience from elsewhere suggests that a health VAS does increase the ARPU and reduce the churn for MNOs. At the time of writing Airtel were considering analysing the use of the mobile phone more broadly of Wazazi Nipendeni users to examine the effects on ARPU and churn.

The Wazazi Nipendeni system seems to be reaching many of those eligible, and subscription rates are good – although they are a little dependent on the 'other' multimedia campaigns. More sustainable advertising and marketing activities might develop through deeper MNO involvement, and indeed this is an idea being pursued.

Within mHealth activities generally there has been much discussion about the communicative strength of SMS (Text). Some argue that literacy levels limit what consumers can get from SMS, and that IVR is a better system to reach the very poor (who have lower literacy rates). Counter arguments have been presented that a) Tanzania has a remarkably high literacy rate, and b) that there is always someone in the family that can read. Indeed, qualitative data suggests that people prefer SMS because it can be shown to neighbours and discussed, as opposed to IVR and OBD which is less easy to listen to in a shared way. Wazazi Nipendeni originally could not implement IVR due to the platform they used – this may change with the new platform, although IVR messaging is to be implemented by HNI through the Vodacom 321 service.



The localisation process within Tanzania resulted in what a number of stakeholders called ‘good quality content’ and had a particularly smooth sign off process because of the linkages with the government through TFNC, one of the core partners.

While the ‘original vision’ of GSMA staff for mHealth within mNutrition may not have been realised fully, the Wazazi Nipendeni service seems a good expression of the intent of the vision.

The development of the new Ministry of Health platform has opened up a new world of opportunities for the mHealth Tanzania PPP. Having commissioned their own platform, they have control over how it is used, which means that they can host multiple services, which presents opportunities to seek new partnerships with interventions interested in using mHealth applications.

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## Annex A Terms of reference

### PO 6420: External evaluation of mobile phone technology based nutrition and agriculture advisory services in Africa and South Asia

#### Introduction

DFID (Research and Evidence Division) wishes to commission an external impact evaluation of mNutrition, a mobile phone technology based nutrition and agricultural advisory service for Africa and South Asia. mNutrition is a programme supported by DFID that, through business and science partnerships, aims to build sustainable business models for the delivery of mobile phone technology based advisory services that are effective in improving nutrition and agricultural outcomes.

mNutrition is primarily designed to use mobile phone based technologies to increase the access of rural communities to nutrition and agriculture related information. The initiative aims to improve knowledge among rural farming communities especially women and support beneficial behaviour change as well as increasing demand for nutrition and agriculture extension services. The mNutrition initiative launched in September 2013 will work in 10 countries in Africa (Cote d'Ivoire, Ghana, Malawi, Mozambique, Nigeria, Tanzania, Kenya, Rwanda, Uganda, Zambia) and four countries in South Asia (Bangladesh, India, Pakistan and Sri Lanka). The desired impact of mNutrition will be improved nutrition, food security and livelihoods of the poor.

Mobile phone based services have been endorsed by WHO as an effective strategy for behaviour change and for driving adherence to anti-retroviral treatment protocols (Horvath, Azman, Kennedy and Rutherford 2012). There is currently scant evidence on the impact and cost-effectiveness of mobile phone technology based services for nutrition and agriculture and on the sustainability of different business models for their provision. A rigorous evaluation of mobile phone technology based nutrition services would add significantly to the current evidence base. An external evaluation team managed by the Evaluator, independent of the programme delivery mechanism, will conduct an assessment of the impact, cost-effectiveness and sustainability of mobile phone technology based information and behaviour change messages for nutrition and agriculture.

#### Background to mNutrition

##### Introduction

Undernutrition is a major challenge to human and economic development globally. It is estimated that almost one billion people face hunger and are unable to get enough food to meet their dietary needs. Agriculture is a major source of livelihood in many poor countries and the sector has a potentially critical role in enhancing health, specifically maternal and child health and nutritional status. A well-developed agriculture sector will deliver increased and diversified farm outputs (crops, livestock, non-food products) and this may enhance food and nutrition security directly through increased access to and consumption of diverse food, or indirectly through greater profits to farmers and national wealth. Better nutrition and health of farmers fosters their agricultural and economic productivity. Current agricultural and health systems and policies are not meeting current and projected future global food, nutrition and health needs.

Despite major investment in agricultural and nutrition research and its uptake and application, there is significant social and geographic inequality in who benefits from these investments. Furthermore, in many developing countries, public extension systems for agriculture, health and nutrition are inefficient, have limited capacity and have a poor track record of delivery, especially in terms of supporting women and girls and the most marginalised populations (Alston, Wyatt, Pardey, Marra and Chan-Kang 2000; Anderson 2007; IFPRI 2010; Van den Berg and Jiggins 2007).

Several research and mobile network operators (MNOs) are testing a range of information and communication technology (ICT) solutions for improving access to a wide range of information and



advisory services. Mobile phone based technologies are among the most promising ICT strategies, although current initiatives in nutrition are relatively small and fragmented.

### **What is mNutrition?**

Enhancing access to the results of nutrition and agricultural research and development is potentially critical for improving the nutrition, health and livelihoods of smallholders and rural communities. mNutrition will harness the power of mobile phone based technologies and the private sector to improve access to information on nutrition, health and agricultural practices especially for women and farmers (both male and female). Specifically, mNutrition will initiate new partnerships with business and science to deliver a range of services including:

- An open-access database of nutrition and agriculture messages for use in mobile phone based communication (for example, information and behaviour change messages on practices and interventions that are known to have a direct impact on nutrition or an indirect impact via for example agriculture);
- A suite of mobile phone based nutrition and agriculture information, extension and registration services designed to: improve knowledge and generate beneficial behaviour change in nutrition and agriculture; increase demand for nutrition, health and agriculture goods and services; register and identify target populations for support; and, using real-time monitoring, support the conduct of nutrition risk assessments by community health workers.

The impacts of mNutrition are expected to include improved nutrition, food security and livelihoods of the poor, especially women in 10 countries in Africa (Cote d'Ivoire, Ghana, Kenya, Malawi, Mozambique, Nigeria, Rwanda, Tanzania, Uganda and Zambia) and 4 countries in South Asia (Bangladesh, India, Pakistan and Sri Lanka). This impact will result from the increased scale and sustainability of mobile phone based nutrition and agricultural-based information services, delivered through robust public private partnerships in each country.

mNutrition has two major outcomes. One outcome will be cost-effective, sustainable business models for mobile phone enabled nutrition and agriculture services to 3 million households in 10 countries in Africa and 4 countries in South Asia that can be replicated in other countries. Linked to this outcome, the second outcome will expect these services to result in new knowledge, behaviour change and adoption of new practices in the area of agriculture and nutrition practices among the users of these mobile phone based services.

These outcomes will be achieved through four outputs:

- Improved access to relevant mobile based health, nutrition and agricultural advisory services for 3 million poor people and community health workers across 10 SSA and 4 Asian countries;
- Launch and scaling of mobile phone based health, nutrition and agricultural advisory services targeted to poor people and community health workers;
- Generation and dissemination of high quality research and evidence on the impact, cost-effectiveness and sustainability of mobile phone based advisory services in nutrition and agriculture in South Asia and SSA; and
- Development of locally relevant content for mobile phone technology based agriculture and nutrition services meeting demands from users and community health workers.

In terms of promoting behaviour change and/or adoption of new practices, mNutrition will seek to achieve changes in one or more of the following areas:

- Adoption of new agricultural practices that are nutrition sensitive, improve agricultural productivity and utilise post-harvest technologies
- Changes in nutrition practices in either one or several knowledge domains including improved maternal nutrition practices during pregnancies; infant and young child feeding practice; and micro-nutrient supplementation to children at risk (i.e. Vitamin A, Zinc and Oral Rehydration Solution (ORS)).

mNutrition has started implementation from September 2013. For the 2 countries selected for the impact evaluation (Tanzania and Ghana), mobile network operators and content providers have been identified through a competitive process during the first half of 2014. The MNOs and content

providers started developing and launching their services during the 4th quarter of 2014 and early 2015. The mobile phone based advisory services are expected to run at least till 3rd quarter of 2018.

### **mNutrition Project Coordination**

DFID support to mNutrition will be channelled to GSMA, as well as directly to this associated independent external impact evaluation. GSMA is a global body that represents the interests of over 800 mobile operators. GSMA already works with the major mobile operators across Africa, (including Airtel, MTN, SafariCom/VodaCom) with a collective mobile footprint of more than 67% of total African connections. GSMA has a number of existing development initiatives, including mHealth and mFarmer, that are part of GSMA's Mobile for Development which brings together mobile operator members, the wider mobile industry and the development community to drive commercial mobile services for underserved people in emerging markets. GSMA will provide technical assistance to mobile phone operators, and support new partnerships with content providers to develop and scale up new nutrition and agriculture message services. GSMA will ensure sharing of best practices and promote wider replication and uptake of effective business models.

## **Objective and Main Questions**

The objective of this work is to conduct an external evaluation of the impacts and cost-effectiveness of the nutrition and agriculture advisory services provided by mNutrition compared to alternative advisory services available in the two selected countries (Ghana and Tanzania), with particular attention paid to gender and poverty issues. The impact assessment is required to answer the following questions that relate to impact, cost-effectiveness and commercial viability:

- What are the impacts and cost-effectiveness of mobile phone based nutrition and agriculture services on nutrition, health and livelihood outcomes, especially among women, children and the extreme poor?
- How effective are mobile phone based services in reaching, increasing the knowledge, and changing the behaviour, of the specific target groups?
- Has the process of adapting globally agreed messages to local contexts led to content which is relevant to the needs of children, women and poor farmers in their specific context?
- What factors make mobile phone based services effective in promoting and achieving behaviour change (if observed) leading to improved nutrition and livelihood outcomes?
- How commercially viable are the different business models being employed at country level?
- What lessons can be learned about best practices in the design and implementation of mobile phone based nutrition services to ensure a) behaviour change and b) continued private sector engagement in different countries?

Further evaluation questions related to other aims of mNutrition will be addressed in at least 1 country (either Ghana and/or Tanzania):

- Are mobile phone based services a cost-effective way to register and identify at risk populations to target with nutrition support?
- Are mobile phone based services a cost-effective way for community health workers to improve the quality and timeliness of data surveillance (a core set of nutrition-related indicators)?

The content for the mobile phone based advisory services will be based on international best practices and widely endorsed protocols (i.e. by the World Health Organisation) and evidence-based nutrition-sensitive agricultural practices identified by international experts. Through an iterative multi-stakeholder process, international and country experts will localise and adapt the content to make it relevant to the specific target audience in the 14 countries. The adapted content and nature of messages is expected to vary across specific target audiences within and across countries. The main purpose of assessing the relevance of the content is not to evaluate the overall health and nutrition content but on how this content has been localised and adapted and to what extent the needs of the specific target groups within their particular context have been met.

In assessing the commercial viability, it is recognised that evaluating the sustainability/long-term financial viability of the mobile phone based advisory services will be difficult as mobile network

operators may not be willing to provide this potentially commercially sensitive information. Therefore, GSMA will provide support through its access to aggregated confidential financial results of the mobile network operators providing the service. GSMA will provide a financial summary report on the commercial viability of the business models without compromising the commercial sensitivity of the data for the mobile network operators. The evaluator will assess and validate commercial sustainability through an analysis of the aggregated information provided by GSMA and additional qualitative business analysis approaches.

The Evaluator has the option of proposing refinements of the existing evaluation questions during the inception phase as part of developing the research protocol. These suggestions will be considered by the Steering Committee and an independent peer review during the review of the research protocol as part of the inception phase.

## **Output**

The output of this work will be new and robust evidence on the impact, cost-effectiveness and commercial viability of mobile phone based advisory services focusing on nutrition and agriculture delivered by public and private partners, and including the development of robust methodological approaches to impact assessment of phone based advisory services.

## **Recipient**

The primary recipient of this work will be DFID, with the beneficiaries being GSMA, governments, international agencies, foundations, MNOs and other private companies and civil society involved in policies and programmes in nutrition and agriculture that are aimed at improving nutritional, health and agricultural outcomes. The findings of this impact evaluation are intended as global public goods.

## **Scope and timeline**

The scope of this work is to:

- Develop a research protocol for the external evaluation of mNutrition;
- Design and undertake an external evaluation of mNutrition in two countries: Ghana and Tanzania;
- Contribute to the communication of the learning agenda, evaluation strategy and evaluation results.

The evaluation will be in two of the 14 mNutrition target countries; Ghana and Tanzania. These countries have been selected based on the phased start-up of mNutrition programme activities. The focus and approach in the two respective countries will be different allowing for a comparison of the effectiveness of approaches applied. In Tanzania, mNutrition will focus on mobile phone technology based nutrition and health services and registration and identification of target population. In Ghana, the mobile phone technology will focus on nutrition and agriculture sensitive services.

In terms of coverage in number of people being targeted for these services, in total 3 million people will be reached through mNutrition; including 2 million for nutrition sensitive agriculture advisory messages in 4 Asian and at least 2 African countries and about 1 million beneficiaries for mobile phone based nutrition services in 10 countries in SSA.

The evaluation contract period will be September 2014 to 31<sup>st</sup> December 2019. The development of the research protocol must be completed by month 4 for review and approval by DFID. Full details on tasks and deliverables are provided in sections below.

## **Statement on the design of the mNutrition evaluation**

The evaluation design is expected to measure the impact, cost-effectiveness and commercial viability of mNutrition, using a mixed methods evaluation design and drawing on evidence from two case study countries and the M&E system of the programme. Overall, the proposed design should ensure that the evidence from the two case study countries has high internal validity and addresses the priority evidence gaps identified in the Business Case. Being able to judge the generalisability/replicability of lessons learned from the programme is of equal importance and so a credible approach to generalisation and external validity will be an important component of the

overall evaluation design. The final evaluation design and methodology to generate robust evidence will be discussed in detail with DFID and GSMA before implementation.

For assessing cost-effectiveness, the Evaluator will further fine-tune their proposed evaluation approach and outline their expectations in terms of data they will require from implementers. A theory based evaluation design, using mixed methods for evaluating the impact has been proposed. During the inception phase, the Evaluator will put forward a robust evaluation design for the quantitative work, either an experimental or a quasi-experimental method, with a clear outline of the strengths and limitations of the proposed method relative to alternatives. During the inception phase, the Evaluator is also expected to identify clearly what will be the implications of the design for implementers in terms of how the overall programme would be designed and implemented and for evidence to be collected in the programme's monitoring system. The Evaluator will also assess the degree to which it is realistic to assess impacts by early 2019 for a programme where implementation started mid 2015 and, if there are challenges, how these would be managed.

The Evaluator, in its 6 monthly reports, will be required to provide information to feed into the DFID Annual Review and Project Completion Report of mNutrition.

## Gender and inclusiveness

The impact evaluation will pay particular attention to gender and other forms of social differentiation and poverty issues. From current experiences, it is clear that access to and use of mobile services is differentiated along a range of factors, including gender, poverty, geographic marginalisation, education and illiteracy levels. Therefore, the impact evaluation will look at and analyse differentiated access to and potential utilisation of mobile phone based services for improved nutrition and agricultural production. Based on the findings, it will identify opportunities and challenges in having an impact on women in general and more specifically the poor and the marginalised.

## Tasks

The Evaluator will perform the following tasks:

### **A. Finalise a coherent and robust evaluation approach and methodology based on their proposal (inception phase)**

- Conduct landscape analysis of existing experiences in mobile phone based services for nutrition and agriculture based on available publications and grey project documents to identify additional critical lessons and priorities for evidence gathering and programme design and implementation;
- Ensure that gender issues and poverty issues are well integrated into the impact evaluation design;
- Develop robust sampling frameworks, core set of indicators and research protocols that allow the consistent measurement and comparison of impacts across study countries, taking into account differences in business models and programmes as needed;
- Work closely with mNutrition programme team in GSMA to familiarise them with impact assessment methodology, discuss evaluation approaches, identify and agree on data provided by programme monitoring system and possible modifications to design;
- Identify risks to the evaluation meeting its objectives and how these risks will be effectively managed;
- Review existing evaluation questions and if deemed relevant propose refinement of existing questions and/or add other questions;
- Prepare a research protocol, including an updated workplan, project milestones and budget. The research protocol will be subject to an independent peer review organised by DFID; and
- Develop a communication plan.

### **B. Implement and analyse evaluations of impact, cost-effectiveness and commercial viability in accordance with established best practices**

- Based upon the agreed evaluation framework, develop and test appropriate evaluation instruments which are likely to include data collection forms for households, community health workers, service providers including health and agricultural services, content providers and private sector stakeholders including mobile network operators. Instruments will involve both quantitative and qualitative methods;
- Register studies on appropriate open access study registries and publish protocols of studies where appropriate;
- Conduct baselines and end-lines, qualitative assessments and business model assessments in both of the two impact evaluation countries;
- Conduct and analyse the evaluations and present findings in two well-structured reports addressing the evaluation questions. The reports should follow standard reporting guidelines as defined by, for example, the Equator Network. Primary findings should be clearly presented along with a detailed analysis of the underlying reasons why the desired outcomes were/were not achieved;
- The Evaluating Organisation or Consortium may subcontract the administration of surveys and data entry, but not the supervision of those tasks, study design, or data analysis; and
- The country-specific mixed methods evaluation reports, cost effectiveness and business models studies and final evaluation report will be subject to an independent peer review organised by DFID.

### **C. Contribute to the communication of the learning agenda, impact evaluation strategy, and evaluation results.**

- Develop a communication plan outlining the main outputs and key audiences;
- Conduct lessons learnt workshops in each of the 2 impact evaluation countries and key dissemination events; and
- Assist in communicating the results of the evaluation and contribute to the development and communication of lessons learnt about mobile phone based extension approaches in nutrition and agriculture.

## **Deliverables**

The Evaluator will deliver the following outputs<sup>31</sup>:

During the design and study inception phase of maximum 4 months:

- A publishable landscape analysis report highlighting lessons learnt from existing initiatives on mobile phone based advisory services related to nutrition and agriculture by month 4;
- An updated work plan with project milestones and budget by end of month 1 (possibly adjusted based on the approved research protocol by month 4);
- A communication plan outlining the key outputs, audience and timeline for review and approval by month 4; and
- A full research protocol by month 4 for review and approval. The research protocol should be registered with appropriate open access study registries;

Interim reports:

- 4 biannual progress reports for the External Evaluation as a whole, and for each country evaluation, against milestones set out in the workplan;
  - Two desk reviews submitted by June 2016
  - Two Baseline quantitative reports submitted by April 2017
  - Two Baseline qualitative reports submitted by February 2017
  - Two Cost-effectiveness reports 1 submitted by March 2017
  - Two Business Model reports 1 submitted by March 2017
  - Two Mixed Methods Baseline reports completed by September 2017
  - Two Midline qualitative reports submitted by March 2018

<sup>31</sup> Exact timeframe of deliverables will be agreed on during the design phase as appropriate.



- All survey data collected during the evaluation provided in a suitable format to DFID for public release.

At project's end:

- Two Endline quantitative reports submitted by June 2019
- Two Endline qualitative reports submitted by August 2019
- Two Cost-effectiveness report 2 submitted by July 2019
- Two Business Model report 2 submitted by July 2019
- Two Evaluation reports submitted by October 2019
- At least 1 article, based on the findings from the country evaluation reports, published in a research journal;
- A shared lesson learnt paper published and at least one presentation highlighting key lessons for similar initiatives of promoting mobile based technologies for providing extension services and the promotion of uptake of technologies by December 2019.

Research protocol and all final reports will be independently peer reviewed. This will be organised by DFID. Outputs are expected to be of sufficiently quality so that a synthesis of findings can be published in a leading peer-reviewed journal.

## Coordination and reporting requirements

A mNutrition Advisory Group (AG) will be established for the programme which will a) provide technical oversight and b) maximise the effectiveness of the programme. The Advisory Group will meet on a bi-annual basis and comprises of representatives of DFID, NORAD and GSMA representatives and independent technical experts. The Evaluator will be managed by DFID on behalf of the mNutrition Advisory Group. The Evaluator will work closely with the mNutrition programme team in GSMA and its specific country implementing partners. The Evaluator will:

- Ensure coherence and lesson learning across all pilot impact assessments on the key evaluation questions and indicators identified.
- Incorporate a clear code of ethics; incorporate plans for open access publications and public access to data sets.

The Evaluator will work closely with the mNutrition project management team, in particular in the design of the overall evaluation framework and the evaluation plan for the specific project components and the countries selected for the evaluation. Collaboration and regular communication between Evaluator and mNutrition project management team and implementing partners in selected case study countries is crucial as the evaluation design may have implications for project implementation and vice versa. The mNutrition project management team will lend support in communication as requested by the Evaluator or the Advisory Group. The Evaluator will report directly to DFID who will manage the evaluation on behalf of the mNutrition Advisory Group. The main point of contact for technical matters is Louise Horner, Livelihoods Adviser and Hugh McGhie, Deputy Programme Manager for all other project related issues. The mNutrition Advisory Group will be the arbiter of any disputes between the evaluation function and the overall programme implementation.

At the end of each 6 months, the Evaluator will submit a brief report outlining key achievements against the agreed deliverables. Pre-agreed funding will then be released provided that deliverables have been achieved.

In addition to the 6 monthly reports outlined above, the Evaluator will provide information to feed into the DFID Annual Review of mNutrition. The 6 monthly reports will be a key source of information used to undertake the Annual Review and Project Completion Report for the programme. These reviews will be led by the Livelihoods Adviser and Deputy Programme Manager, in consultation with the mNutrition AG. All reviews will be made available publicly in line with HMG Transparency and Accountability Requirements.



Mandatory financial reports include an annual forecast of expenditure (the budget) disaggregated monthly in accordance with DFID's financial year April to March. This should be updated at least every quarter and any significant deviations from the forecast notified to DFID immediately. In addition the Evaluator will be required to provide annual audited statements for the duration of the contract.

## **Contractual Arrangements**

The contract starts in September 2014 and will run till end of December 2019 subject to satisfactory performance as determined through DFID's Annual Review process. Progression is subject to the outcome of this review, strong performance and agreement to any revised work plans or budgets (if revisions are deemed appropriate).

A formal break clause in the contract is included at the end of the inception period. Progression to the implementation phase will be dependent on strong performance by the Evaluator during the inception period and delivery of all inception outputs, including a revised proposal for implementation period. Costs for implementation are expected to remain in line with what has been agreed upon for this contract, with costs such as fee rates fixed for contract duration. DFID reserves the right to terminate the contract after the inception phase if it cannot reach agreement on the activities, staffing, budget and timelines for the implementation phase.

DFID reserves the right to scale back or discontinue this assignment at any point (in line with our Terms and Conditions) if it is not achieving the results anticipated. The Evaluator will be remunerated on a milestone payment basis. DFID has agreed an output based payment plan for this contract, where payment will be explicitly linked to the Evaluator's performance and effective delivery of programme outputs as set out in the ToR and approved workplan. The payment plan for the implementation phase will be finalised during the inception period.

### **Open Access**

The Evaluator will comply with DFID's Enhanced and [Open Access Policy](#). Where appropriate the costs of complying with our open access policy should be clearly identified within your commercial proposal.

### **Branding**

The public has an expectation and right to know what is funded with public money. It is expected that all research outputs will acknowledge DFID support in a way that is clear, explicit and which fully complies with DFID Branding Guidance. This will include ensuring that all publications acknowledge DFID's support. If press releases on work which arises wholly or mainly from the project are planned this should be in collaboration with DFID's Communications Department.

### **Duty of Care**

The Evaluator is responsible for the safety and well-being of their Personnel (as defined in Section 2 of the Contract) and Third Parties affected by their activities under this contract, including appropriate security arrangements. The Evaluator is responsible for the provision of suitable security arrangements for their domestic and business property. DFID will share available information with the Evaluator on security status and developments in-country where appropriate.

The Evaluator is responsible for ensuring appropriate safety and security briefings for all of their Personnel working under this contract and ensuring that their Personnel register and receive briefing as outlined above. Travel advice is also available on the FCO website and the Evaluator must ensure they (and their Personnel) are up to date with the latest position.

The Evaluator has confirmed that:

- The Evaluator fully accepts responsibility for Security and Duty of Care.

- The Evaluator understands the potential risks and have the knowledge and experience to develop an effective risk plan.
- The Evaluator has the capability to manage their Duty of Care responsibilities throughout the life of the contract.

## Annex B Stakeholders Consulted

Stakeholder consultations have been carried out throughout the period with a particular focus on establishing relationships with key individuals in stakeholder institutions in Tanzania. A field visit was carried out from 6<sup>th</sup> – 9<sup>th</sup> February 2017, during which Gamos personnel visited and interviewed key personnel from Wazazi Nipendeni stakeholders (mHealth Tanzania PPP, TFNC, MNO), as well as alternative mHealth service providers such as D-Tree which focuses on provision of ICT for health workers (in order to improve the interaction with their clients) who also promote Wazazi Nipendeni (see Table 6).

**Table 6 Stakeholder contact list**

Key stakeholders	
GSMA	Natalia Pshenichnaya (Head of mNutrition)
GSMA	Alexander Roche (Business Intelligence mHealth)
GSMA	Diana Sang (Rep for Tanzania)
CABI	Charlotte Jordan (Nutrition Project Manager)
CABI	Fraser Norton (Mobile Programme Executive)
GAIN	Kyla Stockdale (Senior Programme Manager)
frog design	Lilian Tse (Global Program Manager for Social Impact Practice)
mHealth Tanzania PPP	Janita Ferentinos (Country Manager)
mHealth Tanzania PPP	Muttah Saulo (M&E)
CARDNO	Violet Ketani (Program Manager; P4 Project)
TFNC	Neema Joshua (Senior Research officer)
TFNC	Joyceline Kaganda (Managing Director)
Airtel	Prisca Tembo (International Business & Roaming & VAS)
Alternative service providers	
D-Tree	Lucy Fulgence (Country Director, Tanzania)
Telenor health	Sajid Rahman (Chief Executive Officer, Comparator service (Bangladesh))
Kopagas (Tanz) Millicom International Cellular	David Gilarranz (Global Head of Digital and VAS, Birth registration Tanz)